Australian Government

Department of Infrastructure and Transport

# Walking, Riding and Access to Public Transport

DRAFT REPORT FOR DISCUSSION – OCTOBER 2012

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# Contents

# Executive Summary

## Walking and riding are fundamental everyday modes of transport and are a vital component of Australia's transport system.

Many people walk to local destinations such as their local shops, cafes or services such as the post office or library. Others walk on a daily basis to their place of work or study. Most public transport journeys start and end with a walk from the bus stop or train station to the final destination. Bicycle riding, whilst much less prevalent, is also becoming increasingly popular as a form of transport.

This report explores how a national approach might help to encourage and support walking and riding as part of the transport system in Australia's cities and towns.

All state and territory governments, and many local governments, have policies and programs in place to increase mode share of walking and riding and to improve access to public transport. For example, the National Cycling Strategy aims to double the participation rate between 2011 and 2016 and has been agreed to by all Australian transport ministers. Despite the importance of walking, it is often overlooked as a mode of transport. There is currently no nationally agreed strategy for walking.

This report explores how Australian governments can work with businesses and the community to increase the mode share of walking, riding and public transport.

Getting more people regularly walking, riding and catching public transport is likely to result in a range of positive outcomes across a wide range of policy areas. As part of a broader system of planning, land use and transportation networks, increased mode share of walking, riding and public transport can contribute towards:

- increased capacity in the transport network
- improved public health and reduced healthcare costs
- improved community wellbeing and social cohesiveness
- reduced environmental impacts.

This draft report explores options to increase the mode share of walking, riding and public transport through:

### PLANNING: including walking and riding when planning for land use and transport

1. **Working within a clear hierarchy of planning**

   Integrating land use and transport planning; and identifying principal walking and riding routes in state, regional and local plans.

2. **Designing networks of continuous, convenient connections**

   Enabling short walking and riding trips for transport purposes; improving access to and within major activity, employment and education centres; and improving access to public transport stops.

### BUILDING: Building appropriate infrastructure for walking and bicycling needs

3. **Creating safe environments for pedestrians and bicycle riders**

   Separating pedestrians and riders from vehicles, particularly in high-speed and high-volume traffic; sharing road space, with appropriate speeds, in high-pedestrian environments; and recognising the vulnerability of bicycles as road vehicles.

4. **Incorporating pedestrian and bicycle facilities when building other infrastructure**

   Recognising 'positive provision' policies of states and territories; avoiding costly retrofitting; and incorporating mid- and end-of-trip facilities.

### ENCOURAGEMENT: Encouraging greater participation in walking, riding and public transport

5. **Leveraging infrastructure investment**

   Considering programs and incentives to encourage greater participation in walking, riding and public transport; and improving awareness and skills in the broader population.

6. **Providing consistent standards and guidelines, monitoring and evaluation**

   supporting nationally consistent guidance and sharing of best practice; improving monitoring and evaluation; and developing nationally consistent decision-making processes.

The Australian Government seeks your views on this draft report and its recommendations.

Following the submission of your comments, the Australian Government will consider what actions may be appropriate to undertake in partnership with state, territory and local governments, businesses and the community.

# Your feedback

The Australian Government seeks your views on the issues associated with and opportunities to facilitate increased walking and bicycle riding for transportation purposes, and improved access to public transport.

The draft report can be downloaded from www.infrastructure.gov.au/activetransport.

You can respond to any of the following questions specifically or write a more general response.

1. How can we better plan for comprehensive **20-minute walking and riding networks** around central business districts, major activity centres and major education and health campuses?
2. How can we improve **access to public transport** (train stations, bus, tram and ferry stops) through better walking and riding connections? What are the roles of local, state, territory and Commonwealth governments?
3. How can the Australian Government, through its various programs, **encourage better planning and building** of networks for walking and riding?
4. How can we ensure that appropriate infrastructure for walking and riding is included when other transport infrastructure is being constructed so that we can **avoid costly retrofitting** at a future date?
5. How can governments, businesses and the community work together to leverage infrastructure investment with **other programs and incentives** to encourage greater uptake of walking, riding and public transport?
6. How can we further achieve **consistent standards** for facilities, road rules and vehicle design to ensure the safety and convenience of all road users?

**You must submit your response electronically at www.infrastructure.gov.au/activetransport by 5pm on 31 January 2013.**

Please note that, unless otherwise requested, all submissions will be treated as public documents and will be posted on the Department's website.

Any enquiries should be directed to activetransport@infrastructure.gov.au.

# Definitions

For the purposes of this paper, the following definitions apply:

| | |
|---|---|
| Active travel or active transport | This paper uses 'active transport' and 'active travel' interchangeably. Active travel and active transport use human powered mobility – such as walking or riding – for all or part of a transport journey.<br><br>The focus of this paper is on the use of active transport/travel to access jobs, education, services and social opportunities rather than for recreational purposes alone.<br><br>A public transport journey (by bus, train, ferry or tram) is often accompanied by a walk or ride to and from the transport stop or station. |
| Walking, riding | When the terms walking and riding are used in this paper, they generally refer to any form of human powered mobility: walking on two feet; using a wheelchair or other personal mobility device; pushing a pram or wheeling luggage; riding a bicycle, e-bike/pedelec, scooter, skateboard, tricycle or rollerblades.<br><br>Note, however, that bicycles are defined in the Australian Road Rules as vehicles, whereas most other wheeled mobility devices are defined as pedestrians (including motorised wheelchairs powered up to 10 kilometres per hour and wheeled recreational devices). |
| Mobility | Ease with which people can move around, between or within locations. |
| Accessibility | Ability and ease with which people can access places, and social and economic opportunities, within a reasonable time and cost. Includes physical access to public transport, buildings and facilities. |

| | |
|---|---|
| Transport systems or networks | Includes physical infrastructure (such as roads, rail, footpaths, bike paths) and services (such as bus, train, tram, light rail, ferry) that provide transport connections between different locations and activities. |
| Trip | Travel between two points, from an origin to a destination, which may also be a round trip. A trip can involve multiple modes of travel and short stops along the way (for example, to post a letter, buy groceries or pick up a child). |
| Density and land use mix | The intensity of urban development and the range of different uses (such as residential, commercial, institutional or recreational uses) within a locality.[1] |

1 Australian Government 2011, *Creating Places for People: an urban design protocol for Australian Cities*, p15.

# PART ONE

## INTRODUCTION AND SUMMARY

# CHAPTER 1
# Introduction

The objective of this report is to **assess options for improving the capacity of our urban transport systems by**:

a. increasing the mode share of walking and riding for short trips, and
b. improving access for people walking or riding to public transport stops.

The report explores how the Australian Government can work with the other levels of government, businesses and the community to encourage and support walking and riding as part of the transport systems in Australia's cities and towns.

## The role of active travel as part of a broader transport system

There are many ways we travel in cities and towns. Different modes of travel suit different purposes but all are part of our urban transport systems.

Cars are ideal for a wide range of purposes, including travelling long distances, carrying multiple passengers or heavy loads and when other modes of transport are not available.

Public transport is designed for a range of distances to key destinations, depending on the type of service provided. Most public transport journeys start and end with a walk to and from the bus stop or train station. Well-placed walking and bicycle riding networks can extend the catchment of public transport systems.

Walking works best for short distances up 20 minutes (two kilometres) and is more likely to occur in locations with convivial streetscapes; good access to public transport; and a wide range of nearby destinations such as shops, schools, workplaces, recreational activities and services like a post office or library. Most Australians walk at some stage in their day: in all the capital cities except Brisbane, at least four out of 10 people walk for transport purposes other than to work or study.[2]

Bicycle riding can be suitable for regular trips up to 20 minutes (five kilometres). Whilst longer distances are possible, it is unlikely to appeal to a majority of the population. Many of the qualities that make a place attractive for walking also make it more attractive for riding. Riding is more common in areas with well-connected bicycle pathways that allow people to ride from door to door safely and easily, and where secure facilities for parking are available.

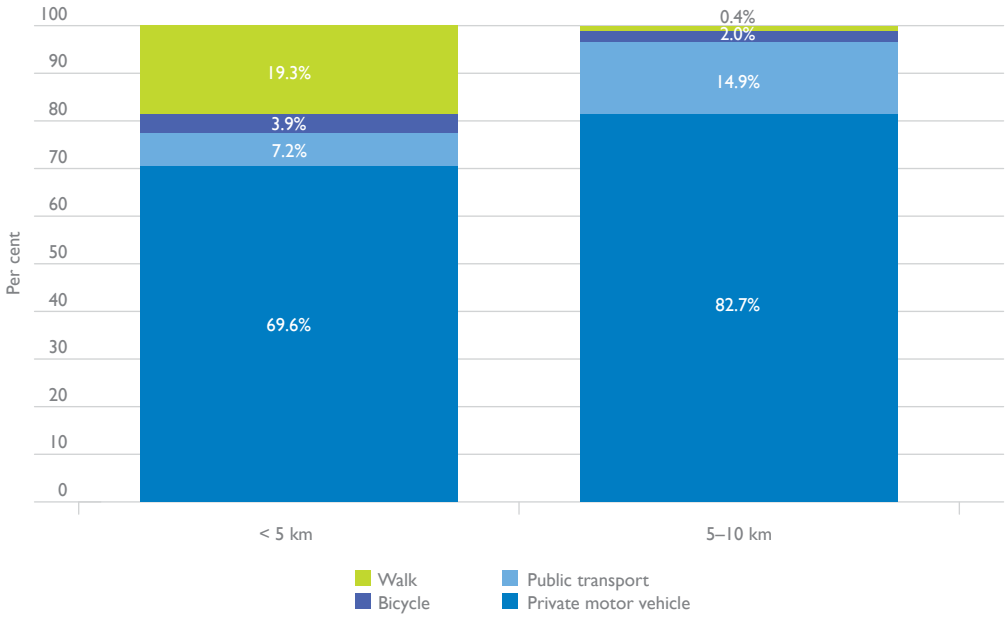
2 ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 6.

Driving is the dominant mode of travel to work or study for most Australian adults, even for short distances: 14.0 per cent of the adult population drive less than five kilometres each way to work or study; and another 16.5 per cent drive between five and 10 kilometres. Shifting just a small proportion of these short-distance commuters to walking and riding would increase the capacity of our transport networks.

Figure 1.1 shows the mode share split for commuting journeys under five kilometres, and between five and 10 kilometres. Of commuters travelling less than five kilometres to work or study, 19.3 per cent walk, 3.9 per cent ride, 7.2 per cent use public transport and just under 70 per cent travel by car.

Of those travelling between five and 10 kilometres, 2.0 per cent ride, 14.9 per cent use public transport and nearly 83 per cent drive.

Figure 1.1 Mode share for commuting journeys under five and 10 kilometres




Source: ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 5.

Refer to Chapter 2 Patterns of walking, riding and public transport for more detailed data and analysis in the Australian and international contexts.

## Why the Australian government has an interest in active travel

> "Walking is not simply a local matter. National governments and transport, land use and health ministers have a responsibility to support and encourage walking through leadership and by providing the necessary legal, administrative and technical frameworks. Responsibilities for accommodating the needs of pedestrians and promoting walking are spread across a wide range of organisations and ministries."

OECD, INTERNATIONAL TRANSPORT FORUM 2011[3]

Walking and riding are fundamental modes of transport in everyday travel and are an important component of Australia's overall transport system.

The Australian Government recognises that there are many benefits to be gained from increasing participation in walking and riding on a regular basis as well as using public transport. As part of a broader system of planning, land use and transportation networks, increased mode share of walking, riding and public transport can contribute towards:

- increased capacity in the transport network
- improved public health and reduced healthcare costs
- improved community wellbeing and social cohesiveness
- reduced environmental impacts.

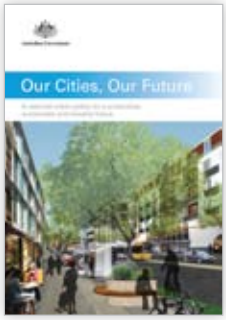
Walking and riding as means of transport can provide many benefits for individuals, families, businesses and local communities. They can improve an individual's health and wellbeing, increase neighbourhood interaction, reduce household travel costs and relieve local traffic congestion.

Getting more people regularly walking, riding and catching public transport, and improving accessibility using these modes of transport, is likely to help achieve objectives of multiple policy areas.

The National Urban Policy, *Our Cities, Our Future*,[4] released by the Australian Government in 2011, identified as key objectives the need to improve accessibility and reduce dependence on private vehicles, and support community wellbeing and public health through the built environment.

3 Organisation of Economic Cooperation and Development (OECD), International Transport Forum 2011, *Pedestrian Safety, Urban Space and Health: summary document*, p9.

4 Australian Government 2011, *Our Cities, Our Future – A National Urban Policy for a productive, sustainable and liveable future*, p18.

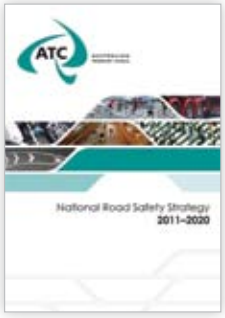



## National Urban Policy

**Reduce dependence on cars and improve transport options; improve public health outcomes**

*Our Cities, Our Future* articulates goals and objectives to achieve greater productivity, sustainability and liveability for the 18 major cities of Australia. It is supported by the annual *State of Australian Cities* report.

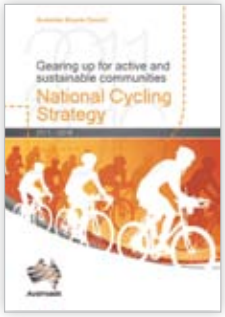
Several other national policies are currently in place that reinforce or complement this position:




## National Road Safety Strategy

**Reduce road deaths and serious injuries by 30% by 2020**

*The National Road Safety Strategy 2011–2020* is signed by state, territory and Australian government road and transport ministers. It adopts the Safe System approach: safe roads, safe speeds, safe vehicles and safe people.




## National Cycling Strategy

**Double rate of participation in cycling between 2011 and 2016**

*The National Cycling Strategy 2011–2016* is signed by state, territory and Australian government road and transport ministers. A survey of 10 000 households provided the 2011 benchmark for this target.


## National Partnership Agreement on Preventive Health

**Reverse overweight and obesity trends by 2018**

The *National Partnership Agreement on Preventive Health* aims for a 15 per cent increase in the proportion of children and adults meeting national guidelines for physical activity by 2018; and the proportion of children and adults with a healthy weight to return to baseline levels by 2018.


## National Disability Strategy 2010–2020

**Inclusive and accessible communities**

Signed by all three levels of government, the *National Disability Strategy* incorporates inclusive and accessible communities to ensure that people with disability live in accessible and well-designed communities with opportunity for full inclusion. It advocates for a public, private and community transport system that is accessible for the whole community.


## Clean Energy Future

**Reduce carbon emissions to 80% of 2000 levels by 2050**

Australia has agreed to reduce its carbon emissions to 5 per cent below year 2000 levels by 2020 and to 80 per cent below year 2000 levels by 2050.
It has also introduced a price on carbon pollution from 1 July 2012. In relation to the transport sector, the carbon price applies only to fuels used in domestic aviation, marine and rail transport.

## Structure of this paper

This consultation process considers how walking and riding can contribute to national objectives and policy outcomes through increased mode share of walking and bicycle riding, as well as improving access to public transport networks.

The remainder of Part One summarises the benefits of, barriers to and opportunities for increasing mode share of walking and riding.

Part Two provides a comprehensive background of the issues related to walking and riding. Chapter 2 presents data on walking and riding in the national and international context. Chapter 3 discusses the economic, health, environmental and community benefits of walking and riding.

Chapter 4 presents a snapshot of current policy settings at the Commonwealth, state, territory and local government levels that may have an impact on the active travel agenda and looks at the barriers and opportunities for increasing walking, riding and accessing public transport (Chapter 5).

Chapter 6 explores ways that some of our current policy and funding settings could be changed to encourage and support the greater uptake of active travel in cooperation with other spheres of government, businesses and the community.

Part Three contains appendices, including a summary of relevant state and territory policies and plans.

# 1.1 Summary of economic analyses

Economic analyses of projects that incorporate walking and riding infrastructure take into account a range of variables including construction and maintenance costs, level of user demand (which depends on location and connections with the overall network) and the incremental benefits gained from shifting users from other modes of transport.

Economic analysis suggests that the benefits of a typical walking or riding infrastructure project include decongestion (20.7 cents per kilometre), health (up to 168 cents per kilometre), vehicle operating costs (35.0 cents per kilometre), infrastructure savings (6.8 cents per kilometre) and environment (5.9 cents per kilometre).[5] A study commissioned by the Queensland Department of Transport and Main Roads in 2011 found that, for a typical off road path located in an inner urban area:[6]

- 1000 pedestrians per day will generate discounted benefits of around $7 million per kilometre over a 30-year appraisal period ($2.12 per kilometre walked)
- 1000 bicycle riders per day will generate discounted benefits of around $15 million per kilometre over a 30-year appraisal period ($1.43 per kilometre cycled).

The average cost of such projects in Queensland has been about $1.5 million per kilometre.

## Avoided costs of traffic congestion and infrastructure provision

Traffic congestion in urban areas, and the consequent economic cost, is a central consideration for assessing various modes of transport. A shift to more walking or riding, particularly for short journeys during peak periods, could add capacity to our roads and reduce the strain on inner city public transport services.

Depending on the location, a mode shift towards active travel can reduce traffic congestion, equating to an 'avoided cost' of around 20.7 cents per kilometre walked or cycled. In addition, the avoided cost of infrastructure provision equates to about 5.2 cents per kilometre and avoided parking cost equates to 1.6 cents per kilometre.[7]

## Public health

A typical cost–benefit analysis for an active transport project shows that public health accounts for most of the economic benefits, even after adjusting for injury costs. The net health benefit (adjusted for injury) for each kilometre walked is 144 cents – about 70 per cent of the total economic benefits of a walking project. The net health benefit (adjusted for injury) for each kilometre cycled is 75 cents – about half of the total economic benefits of a typical bikeway project.[8]

The prevalence of overweight and obesity has been steadily increasing over the last 30 years in Australia and is correlated with increasingly sedentary lifestyles. Over a third of Australia's adults are physically inactive.[9] Australia is now one of the most overweight nations in the OECD, with more than 60 per cent of adults and one in four children being overweight or obese. In 2008 obesity was estimated to cost $58.2 billion to the economy[10] due to diabetes, cardiovascular disease, various cancers and osteoarthritis.

5 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC, table EX.1: benefits summary.
6 *Ibid.*
7 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC.
8 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC, table EX.1: benefits summary.
9 Australian Bureau of Statistics 2009, *National Health Survey 2007–08* (Reissue) cat. no. 4364.0.
10 Access Economics 2008, *The growing cost of obesity in 2008: three years on*, p20.

Incorporating exercise into travel has been identified as a highly effective means to increase daily physical activity, which can help individuals maintain health.

## Environment

Transport is the second-largest emitter of greenhouse gas emissions after electricity generation and other fixed sources.[11] Transport accounts for 88.6 million tonnes of annual carbon dioxide equivalent or about 16 per cent of total emissions, with cars contributing around half of this.[12]

Motor vehicles are a major source of common air pollutants, including hydrocarbons (HC), volatile organic compounds (VOCs) and oxides of nitrogen (NOx). Walking and riding emit significantly less greenhouse gas and air pollutants than motorised forms of transport currently on Australian roads.

The combined environmental benefits of reducing noise and greenhouse gas emissions, and improving air quality, equates to around 5.9 cents per kilometre walked or cycled.[13]

## Construction costs

Construction of walking and riding infrastructure is relatively inexpensive compared with other modes of transport – for example, it costs an average $1.5 million per kilometre to plan and construct a separated bicycle path.[14] This compares with the cost of construction other modes as follows:

- one kilometre of light rail costs the equivalent of 49 kilometres of bikeway
- one kilometre of motorway/road costs the equivalent of 110 kilometres of bikeway
- one kilometre of busway costs the equivalent of 138 kilometres of bikeway
- one kilometre of road tunnel costs the equivalent of 324 kilometres of bikeway
- one kilometre of underground rail costs the equivalent of 533 kilometres of bikeway.[15]

Providing for walking and bicycling infrastructure as part of a broader transport project can be significantly cheaper than retrofitting at a later stage. A recent analysis in South East Queensland showed that incorporating a separated bicycle path as part of a larger transport project added between 0.2 per cent and 9.6 per cent to the overall cost of construction (see section 3.7 of this paper).[16]

Depending on the level of demand and use, these construction costs can be significantly outweighed by the economic benefits. For a typical off-road path located in an inner urban area:

- 1000 pedestrians per day will generate discounted benefits of around $7 million over a 30-year appraisal period ($2.12 per kilometre walked)
- 1000 bicycle riders per day will generate discounted benefits of around $15 million over a 30-year appraisal period ($1.43 per kilometre cycled).[17]

Refer to Chapter 3 Economic analysis of this paper for more detailed information.

11 Department of Climate Change and Energy Efficiency 2011, *National greenhouse gas inventory*, December 2011 (www.climatechange.gov.au/en/publications/greenhouse-acctg/national-greenhouse-gas-inventory-2011-12.aspx).
12 BITRE 2012, *Infrastructure Yearbook*, tables T9.4 and T9.5.
13 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, table EX.1: benefits summary.
14 Queensland Department of Transport and Main Roads 2011, unpublished data.
15 *Ibid.*
16 *Ibid.*
17 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, p.vi. Note that kilometres walked is less than kilometres cycled.

## 1.2 Summary of barriers and opportunities

Having access to well-connected, continuous and convenient routes is an important factor in any transportation system, whether for freight vehicles, cars, public transport, walking or riding.

Some locations have higher mode share of walking and riding than others. Underlying factors include whether these locations have continuous, convenient connections; environments that provide a sense of physical safety and personal security; good quality mid- and end-of-trip facilities such as shade, seating, signage, lighting and bicycle parking; and whether 'soft' encouragement programs such as trip information, social media, skills training and behaviour change programs are in place.

Figure 1.2 shows the barriers and potential opportunities that could be leveraged in order to achieve greater mode share for walking and riding.

## Figure 1.2 Barriers and opportunities

**Objective:** **To improve the capacity of transport systems in our cities and towns by:**
**a. Increasing the mode share of walking and riding for short trips**
**b. Improving access to public transport**

| Barriers | Opportunities |
|---|---|
| **Lack of continuous, convenient connections**<br>• Even short local trips may be impeded by poor connectivity<br>• Public transport stops may be difficult to reach by walking or riding | **Plan comprehensive networks**<br>• Concentrate within 2–5km of activity centres<br>• Ensure networks are comprehensive and continuous (ie door to door)<br>• Integrate with public transport hubs |
| **Lack of physical safety**<br>• Inappropriate infrastructure for the speed and volume of traffic | **Build appropriate infrastructure**<br>• Separate bicycles and pedestrians from vehicular traffic<br>• Consider mixed traffic in high-pedestrian areas with low traffic and low speeds |
| **Lack of personal safety and comfort**<br>• Physical barriers can prevent convenient access across roads or along footpaths<br>• People feel unsafe where there is no 'passive surveillance' from nearby buildings or activities<br>• Lack of lighting, directional signage, seating, drink fountains, shade, or bicycle parking<br>• Topography and weather | **Provide mid-trip facilities**<br>• Lighting, signage, drinking fountains, shade, seating<br>**Provide end-of-trip facilities**<br>• Bicycle parking, change facilities |
| **Lack of awareness**<br>• People may not be aware of their options<br>• People may have misconceptions about the ease and convenience of walking, riding or public transport | **Provide Information**<br>• Websites, trip planners<br>• Real-time information (eg bus arrival times)<br>• Social media<br>• Behaviour change programs |
| **Lack of skills**<br>• People may lack bicycle riding skills<br>• Drivers may not be aware of vulnerable road users | **Provide skills training**<br>• Bicycle skills for school children, adults<br>• Driver awareness of vulnerable road users (eg driver training, promotional campaigns, social media) |
| **Lack of incentives**<br>• Public transport may be hard to reach, irregular or unreliable<br>• Poorly maintained bicycles make it unsafe and difficult to ride<br>• Easy alternatives may exist for short trips (eg easy and cheap car parking) | **Encourage greater participation**<br>• Improve convenience of walking/riding for short trips<br>• Improve quality of public transport<br>• Increase awareness (eg social media) |

Source: Adapted from Austroads 2009, *Guide to Traffic Management – Part 7: Traffic Impacts in Activity Centres* (table 2.4).

# 1.3 Summary of proposed initiatives

There is a range of opportunities for Australian governments to better work with businesses and the community to plan and build walking and riding networks in our towns and cities and encourage greater participation. These are summarised in Figure 1.3.

Figure 1.3 Summary of proposed initiatives


| Work within a clear hierarchy of planning | Create safe environments for pedestrians and bicycles | Leverage infrastructure investment |
|---|---|---|
| a. Integrate land use and transport planning<br>b. Identify principal walking and bicycling routes in state and regional plans<br>*NCS: Integrated planning* | a. Separate pedestrians and bicycles from vehicles, particularly in high-speed and high-volume traffic<br>b. Share road space, with appropriate speeds, in high-pedestrian environments<br>c. Recognise the vulnerability of bicycles as road vehicles<br>*NCS: Infrastructure + facilities, Safety* | a. Consider programs and incentives to encourage greater participation in walking, riding and public transport<br>b. Improve awareness and skills in the broader population<br>*NCS: Promotion, Safety* |
| **Design networks of continuous, convenient connections** | **Incorporate pedestrian and bicycle facilities when building other infrastructure** | **Provide consistent standards and guidelines, monitoring and evaluation** |
| a. Encourage short walking and riding trips for transport purposes<br>b. Improve access to and within major activity centres<br>c. Improve walking and riding access to public transport stops<br>*NCS: Integrated planning* | a. Recognise 'positive provision' policies of states and territories<br>b. Avoid costly retrofitting<br>c. Incorporate mid- and end-of-trip facilities<br>*NCS: Infrastructure + facilities* | a. Support nationally consistent guidance and sharing of best practice<br>b. Improve monitoring and evaluation<br>c. Develop nationally consistent decision-making processes<br>*NCS: Guidance + best practice, Safety, Monitoring + evaluation* |

All states and territories, and the Australian Government, participate in the Australian Bicycle Council to maintain and implement the National Cycling Strategy (see Appendix A). The strategy includes objectives to create comprehensive and continuous networks; integrate land use and transport; and monitor, evaluate and provide guidelines on bicycle-related issues. Currently no such national strategy or organisation exists to promote walking or improved access to public transport.

The following sections provide further detail on the proposed initiatives outlined in Figure 1.3.

## 1.3.1 Planning for comprehensive networks

**Plan**

- include walking and riding when planning for land use and transport

In planning for walking and riding networks, consideration needs to be given to broader issues of integrated land use and transport planning; density; access to jobs, schools, services and facilities; and access to public transport. A more detailed description is provided in section 6.1 of this paper.

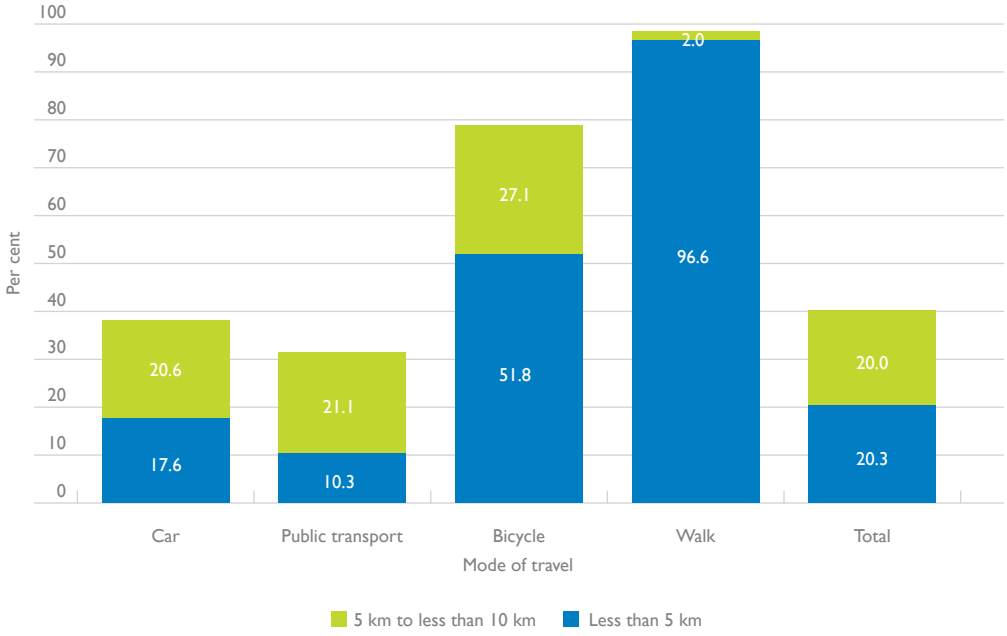
### Improving access to, and within, activity centres

More than one in six adults drives less than five kilometres to work or study on a daily basis. Whilst it is not realistic to replace all of these car trips, there is scope to improve the capacity of our transport systems by increasing the proportion of people that walk or ride for short trips, especially during peak travel periods.

This could be achieved in part by focusing on 20-minute walking and riding catchments around key centres of activity such as shopping districts and job centres; schools, universities and hospitals; and public transport routes.

Figure 1.4 compares cars, public transport, walking and riding, showing the proportion of trips to work or study that are under five or 10 kilometres. Of the adults who ride a bicycle to work or study, half travel less than five kilometres and nearly a third travel between five and 10 kilometres. Of the adults who walk as their main mode of travel, most walk less than two kilometres.[18] A fifth of car regular commuting journeys are less than five kilometres and another fifth are between five and 10 kilometres.

Figure 1.4 Percentage of car, public transport, bicycle and walk commuting trips that are less than 5 or 10 kilometres




Source: ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, table 5.

18 Victorian Department of Transport 2007, *Victoria Integrated Survey of Travel and Activities 2007*; Queensland Department of Transport and Main Roads 2009, *South East Queensland Travel Survey 2009*; New South Wales Bureau of Transport Statistics 2011, *Sydney Greater Metropolitan Area Household Travel Survey 2009–2010.*

In the capital cities, one out of every six commuters (15.9 per cent) travels less than five kilometres to work or study. Outside of the capital cities, one in every four commuters (25.5 per cent) travels less than five kilometres to work or study.[19]

Only 4.2 per cent of adult commuters walk and 1.6 per cent ride a bicycle to work or study as their usual form of transport.[20] However, when asked to nominate what forms of transport they use as alternative ways to get to work or study, more than a third said they sometimes take public transport, 13.7 per cent said they walk and 11.3 per cent said they ride a bicycle (refer to Figure 2.3 in Chapter 2 of this paper).

There are significant benefits to be gained by encouraging people who live within a 20-minute catchment of major activity centres to increase their proportion of regular walking and riding trips for transport purposes. This could be achieved by concentrating on two-kilometre walking catchments and five-kilometre riding catchments around major activity centres.

## Better connections to public transport hubs

There is also significant opportunity to expand catchments for public transport by improving access to train stations; bus, tram and light rail stops; and ferry terminals.

Depending on the circumstances, retrofitting for better connectivity may be extremely difficult or simply a matter of removing minor barriers to improve pedestrian or bicycling access. In the map below (Figure 1.5) the installation of a 30-metre pathway significantly expands the catchment of a train station so that an additional 200 houses are within a five-minute walk.

### Figure 1.5 Expanding a public transport catchment by completing a missing link

*Existing street network and catchment*

*New link with expanded catchment*

Source: Courtesy of GTA Consultants.

19 ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, table 1.
20 *Ibid.*, table 3.

The catchment area for public transport is less than for major activity centres. Research shows that people will generally walk or ride for up to 10 minutes to reach a frequent, direct service such as a train or express bus. This is equivalent to an 800-metre walk or a two- to three-kilometre bicycle ride. However, they will consider walking only up to half this distance to a less frequent or indirect local service.

### Discussion questions:

1. How can we better plan for comprehensive **20-minute walking and riding networks** around central business districts, major activity centres and major education and health campuses?
2. How can we improve **access to public transport** (train stations, bus, tram and ferry stops) through better walking and riding connections? What are the roles of local, state, territory and Commonwealth governments?

## 1.3.2 Building appropriate infrastructure

**Build**

- build appropriate infrastructure for walking and bicycling needs

This section assesses the types of physical infrastructure that are required to encourage greater participation in walking and riding. It outlines the national context for road safety and discusses the types of road environments that are appropriate for pedestrians and bicycle riders to ensure their safety requirements are met. A more detailed description is provided in section 6.2 of this paper.

### Creating safe environments for pedestrians and bicycle riders

The principal objectives when building quality transport infrastructure are to improve road safety and ensure the efficient and smooth flow of traffic. Building appropriate infrastructure for walking and riding can support these objectives. Broadly, there are two suggested types of infrastructure treatment:

a. separating bicycle riders and pedestrians from vehicular traffic, particularly on roads with large volumes of traffic and in high-speed environments
b. sharing road space, with appropriate speed levels, in high pedestrian environments with low traffic volumes.

Note that different legislation, jurisdictional responsibilities and often infrastructure requirements apply to walking (which includes most wheeled mobility and recreational devices) as opposed to bicycle riding. For example, bicycles are defined as vehicles under the Australian Road Rules.[21] In some states and territories (Queensland, Tasmania, the Northern Territory and the Australian Capital Territory) people are permitted to ride bicycles on footpaths unless otherwise signposted whereas other states and territories only permit children under 12 and accompanying adults to do so.

### Different locations require different treatments

Specific treatments for safe road infrastructure need to be considered on a case-by-case basis. These may include separated footpaths and cycle paths; shared user paths; bicycle lanes on roads or sealed shoulders; or mixed traffic in low-speed environments.

21 *Australian Road Rules* – model law www.ntc.gov.au/ViewPage.aspx?documentid=00794

For roads with speeds above 60 kilometres per hour and with more than 5000 vehicles per day, fully separated bicycle paths are recommended – that is, they should be separated from the main vehicle traffic by a verge or physical barrier. More detailed guidance on the selection of particular types of on-road and off-road bicycle facilities is provided by Austroads.[22]

## Recognising policies and plans of states and territories

A number of states and territories, including New South Wales, Victoria, Western Australia, South Australia, the Australian Capital Territory and Queensland, have a 'positive provision' or 'favourable funding' policy in place which requires walking and bicycling infrastructure to be considered with any road infrastructure project. Queensland has expanded this to include rail and public transport projects.

The policies and plans for bicycle and pedestrian networks of state and territory governments could be used to establish a framework to help the federal Department of Infrastructure and Transport to work with other levels of government to improve overall outcomes.

## National infrastructure funding

The broad framework for the Nation Building 2 program was announced with the 2012–13 Budget. Details of each component are currently being developed. There may be opportunities for projects under this or other programs to facilitate further improvements to the efficiency of our urban transport systems by including priorities for incorporating walking and riding infrastructure and improving access to public transport.

## Incorporating mid- and end-of-trip facilities

*Creating Places for People – an urban design protocol for Australian cities*,[23] which was championed by all three levels of government as well as business and community organisations, states that creating a comfortable and welcoming environment is important for encouraging more people to walk or ride. Considerations include personal safety; the ability to navigate within or between locations; the provision of seating, shade, water and toilets; and bicycle parking facilities.

Any infrastructure project that incorporates walking and riding should consider providing mid- and end-of-trip facilities such as:

- lighting and wayfinding – maps and directional signage
- personal amenities – shade, seating, toilets and drinking fountains
- bicycle storage – racks, lockers and enclosures
- bicycle end-of-trip amenities – showers and change rooms
- real-time information such as bus, tram and train arrival times.

### Discussion questions:

3. How can the Australian Government, through its various programs, **encourage better planning and building** of networks for walking and riding?
4. How can we ensure that appropriate infrastructure for walking and riding is included when other transport infrastructure is being constructed so that we can **avoid costly retrofitting** at a future date?

22 Austroads 2008, *Guide to Traffic Management – Part 5: Road Management*, table 3.2.

23 *Creating Places for People* is a collaborative commitment to best-practice urban design in Australia. The protocol is the result of two years of collaboration between peak community and industry organisations, states, territories, local governments, and the Australian Government. See www.urbandesign.gov.au

## 1.3.3 Encouraging greater participation

**Encourage**

- encourage greater participation in walking, riding and public transport

Education, information and promotional activities have been shown to further encourage uptake of walking, riding and public transport where appropriate facilities and infrastructure have been provided. The best results are achieved when planning and infrastructure investments are well supported by education and promotional activities.[24, 25, 26]

Providing consistent standards, guidelines and sharing of best practice and the monitoring and evaluation of policy and program outcomes are also important considerations. A more detailed description and analysis is provided in section 6.3 of this paper.

A number of encouragement programs have been supported by the Australian Government, including TravelSmart, the Healthy Communities Initiative, and the Healthy Spaces and Places initiative, the latter in conjunction with the Heart Foundation, the Australian Local Governments Association and the Planning Institute of Australia.

TravelSmart programs, administered by states and territories, encourage travel behaviour change in targeted workplaces, schools and neighbourhoods (see Appendix D of this paper). A recent evaluation of the TravelSmart workplace program in Perth showed a benefit–cost ratio of 4.5:1 and a reduction in single-person car travel by 4.3 per cent.[27]

A review of Australia's physical activity guidelines for children and adolescents, and also for adults, is currently being undertaken. The draft proposed guidelines, provided as part of the review process, acknowledge that active transport is an important domain in which regular physical activity can occur.

As part of the National Partnership Agreement on Preventive Health Healthy Communities Initiative, six organisations have been funded to deliver a variety of community-based healthy lifestyle programs until June 2013. Two of the funded programs – Heart Foundation Walking and AustCycle – encourage participation in walking and bicycling respectively.

The National Partnership Agreement is also funding 'target group' programs that will be delivered to specific groups – for example, those in schools and workplaces – to promote healthy living and encourage participants to increase physical activity.

Non-government organisations throughout Australia are also coordinating education and promotion activities to encourage safe walking and bicycle riding. Programs include AustCycle, Ride2Work, Walk to Work Day and Walk Safely to School Day.

Both Australian and international experience has consistently shown that the rates of participation in walking and riding can be accelerated when a range of complementary policies and programs are implemented together. Education and skills training, targeted travel behaviour change programs, social marketing and promotion are all part of a broader package that should be considered in conjunction with improved infrastructure.

24 Australian National Audit Office 2012, *Establishment, Implementation and Administration of the Infrastructure Employment Projects Stream of the Jobs Fund*, pp22–23.
25 Victorian Auditor-General 2011, *Developing Cycling as a Safe and Appealing Mode of Transport* – an audit of the 2009 Victorian Cycling Strategy.
26 Pucher, Garrard and Greaves 2010, 'Cycling down under: a comparative analysis of bicycling trends and policies in Sydney and Melbourne', *Journal of Transport Geography,* 19(2011), p344.
27 Marsden Jacob Associates 2011, Evaluation of the TravelSmart Local Government and Workplace Program for Department of Transport WA.

Consideration could also be given to incentives and disincentives, such as pricing, taxation and rebates, that influence people's choices. For example, the United Kingdom has a tax exemption for employers that loan bicycles and safety equipment to employees as a tax-free benefit.[28]

## Nationally consistent standards, guidance, monitoring and evaluation

The *National Cycling Strategy 2011–2016* outlines a number of action areas to provide more consistent standards, guidance, monitoring and evaluation of cycling-related policies and programs (see Appendix A). The strategy could be extended to include pedestrians as well as walking and riding to catch public transport.

The *National Road Safety Strategy 2011–2020* was signed by the Commonwealth, state and territory ministers with responsibility for roads. At a national level, a number of road safety related issues are currently under review, with the aim of better integrating road safety, vehicle and transport efficiency. The National Transport Commission, for example, is reviewing a range of areas affecting transport efficiency and safety, including the model Australian Road Rules.[29]

In addition, governments must ensure that climate change considerations are appropriately factored into the construction and management of infrastructure to ensure that its economic value is preserved and disruption is minimised, especially during extreme weather events.[30]

Austroads is responsible for setting standards and providing guidelines on road-related infrastructure, including walking and bicycle infrastructure. It provides guidance on a wide range of issues related to network planning and infrastructure including:

- the necessity of state and territory strategies to set a direction and provide a framework within which responsible agencies can plan and work
- how to integrate with local strategic bicycle plans
- what constitutes a bicycle network plan
- categories of bicycle riders and their network requirements
- traffic management in activity centres
- detailed technical guidance on types of infrastructure treatments.

### Discussion questions:

5. How can governments, businesses and the community work together to leverage infrastructure investment with **other programs and incentives** to encourage greater uptake of walking, riding and public transport?
6. How can we further achieve **consistent standards** for facilities, road rules and vehicle design to ensure the safety and convenience of all road users?

28 Department for Transport UK 2011, Cycle to work scheme – Implementation guidance, www.dft.gov.uk/publications/cycle-to-work-scheme-guidance
29 National Transport Commission 2011, *Review of the Australian Road Rules and Vehicle Standards Rules discussion paper,* www.ntc.gov.au/viewpage.aspx?documentid=2029
30 Australian Government 2010, *Adapting to Climate Change in Australia – An Australian Government Position Paper,* www.climatechange.gov.au/en/publications/adaptation/position-paper/adapting-to-climate-change-paper.aspx

# PART TWO

## BACKGROUND AND ISSUES

CHAPTER 2

# Patterns of walking, riding and public transport

## 2.1 The Australian context

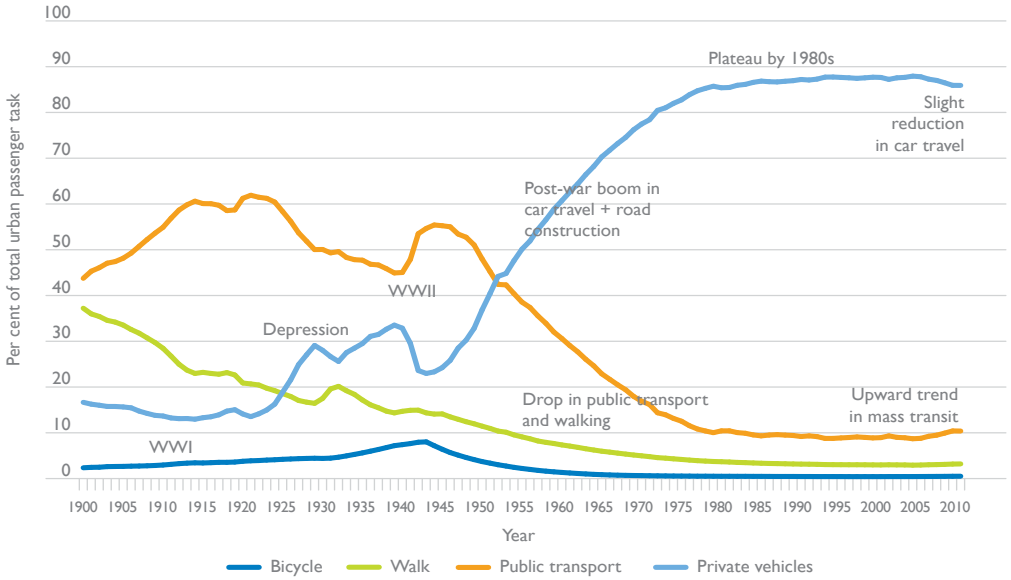
### 2.1.1 How people commute to work or study

Since the middle of last century, Australian cities have been planned and designed predominantly for private motor vehicle travel.[31] Having access to a car has allowed Australians to live further away from fixed train and tram lines and provided the freedom to travel more readily for a wide range of activities including work, shopping, education and recreation.

Figure 2.1 shows there was a dramatic rise in private vehicle travel following the Second World War, with a corresponding decline in public transport, walking and cycling. Changing trends in mode share plateaued by the 1980s, followed by a more recent downturn in private vehicle travel and a corresponding increase in public transport.[32, 33]

31 Australian Government 2010, *Our Cities: the challenge of change,* background and research paper to the national urban policy discussion paper, p7.
32 Cosgrove D 2011, *Long-term patterns of Australian public transport use*, paper presented to the Australasian Transport Research Forum, 28–30 September 2011, Adelaide, South Australia.
33 Newman P & Kenworthy J 2011, '"Peak Car Use": understanding the demise of automobile dependence', *World Transport, Policy and Practice,* 17.2 pp31–42 (www.eco-logica.co.uk/pdf/wtpp17.2.pdf).

Figure 2.1 Proportion of metropolitan travel by kilometres travelled, by mode, 1900–2010

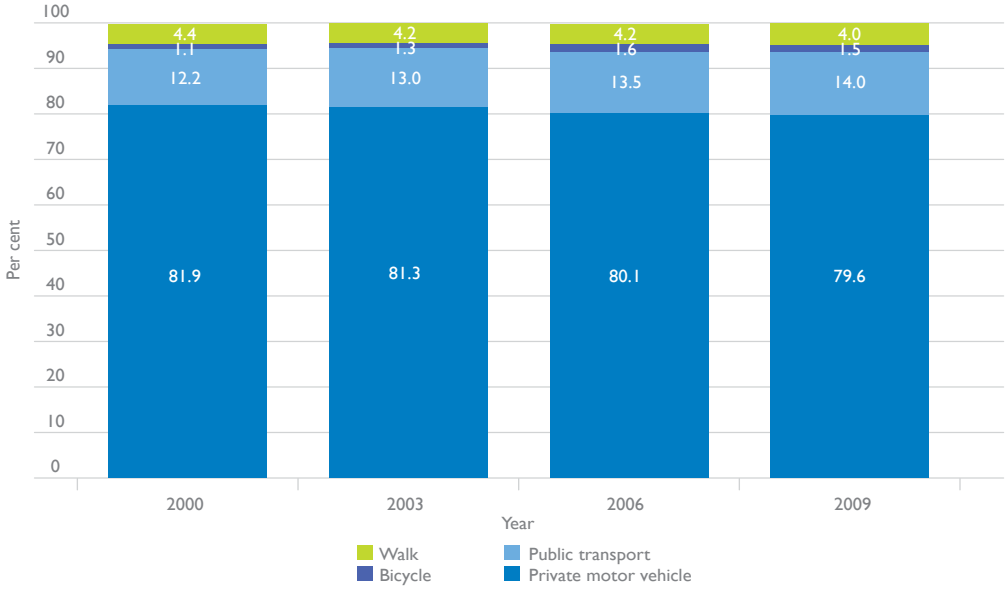



Source: Cosgrove D (BITRE), 2011.

Figure 2.2 shows the main mode of travel to work or full-time study during the period 2000–2009 for Australian adults aged over 18 years.[34]

In 2009 private motor vehicles were used by four out of five adults as the main form of travel to work or study, compared with 14 per cent who used public transport; 4 per cent who walked; and 1.5 per cent who rode a bicycle. These proportions were similar over the 2000–2009 period surveyed, but there was a gradual proportional decrease in private motor vehicle use and walking and an increase in public transport use. The figures for bicycle riding varied slightly across the period.

Figure 2.2 Main mode of travel to work or study for Australian adults, 2000–2009

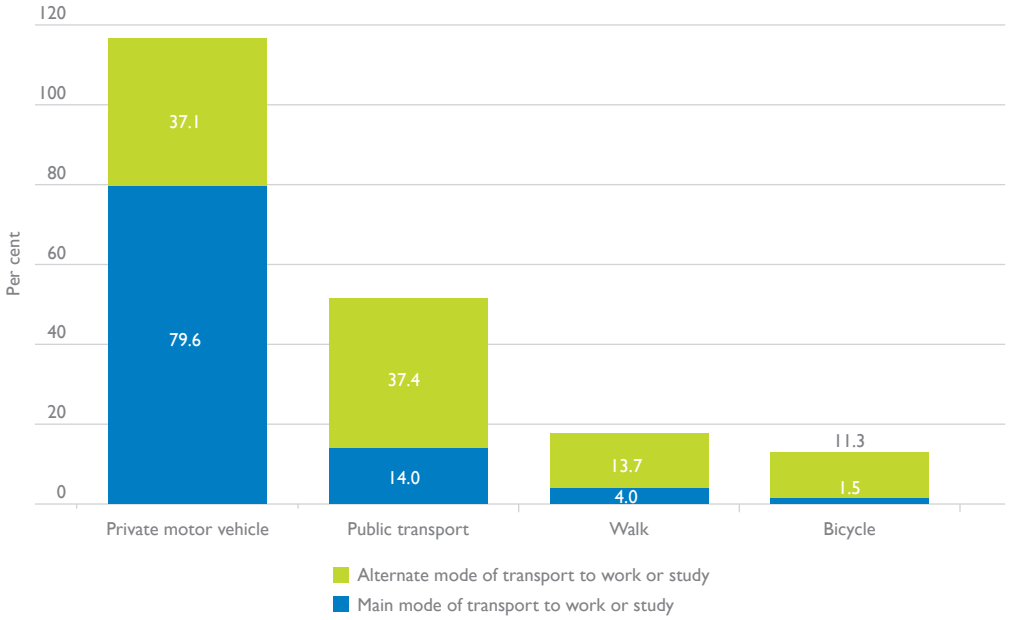



Source: ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 3.

34 ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002.

Figure 2.3 compares the main mode of travel on a usual trip to work or study in 2009 against the alternate mode of transport sometimes used. When asked to nominate what forms of transport they use as an alternative way to get to work or study, more than a third of Australian adults said they sometimes take public transport, 13.7 per cent said they walk and 11.3 per cent said they ride a bicycle.[35]

### Figure 2.3 Main mode and alternate mode of transport to work or study




Source: ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, tables 2 and 18. Note: in its original form, the proportion of trips added to more than 100 per cent because more than one form of transport may have been specified; 'Other' (which may include taxi) has also been removed.

## Travel to school

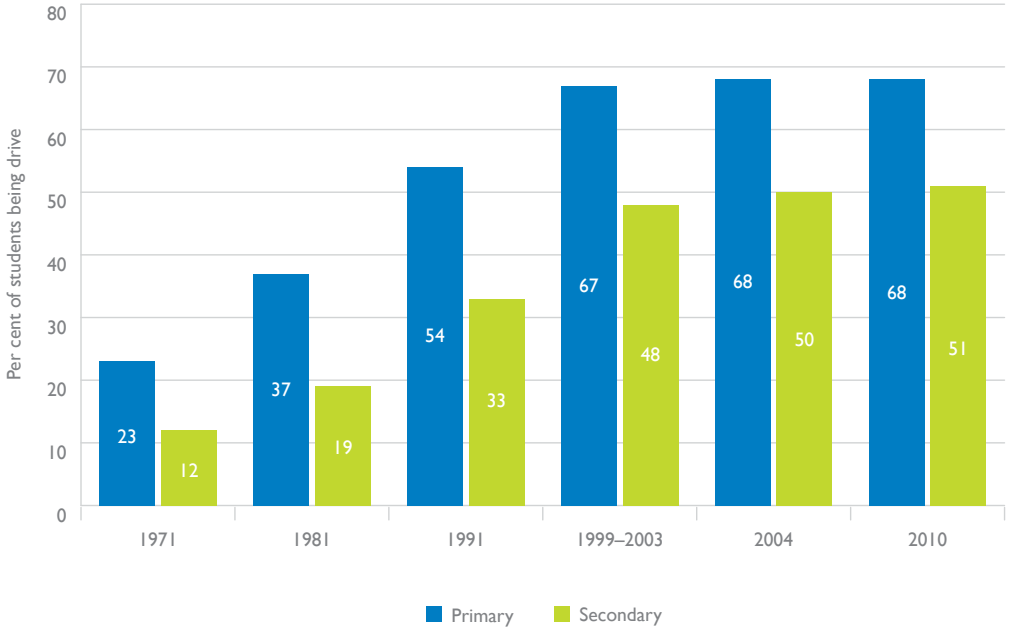
Primary and secondary student travel to school reflects the broader long-term trend towards increased car use. An analysis of data for New South Wales shows that 12 per cent of secondary students were driven to school in 1971.[36] By 2003, almost half of New South Wales secondary students were driven to school (Figure 2.4). The overall percentage of primary and secondary students being driven to school has not significantly changed in New South Wales since 2003.[37]

35 ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, table 18.

36 Van der Ploeg HP, Merom D, Corpus G & Bauman A 2008, 'Trends in Australian children travelling to school 1971–2003: burning oil or carbohydrates?' *Preventive Medicine,* 46 pp60–62.

37 Meron D, Rissel C, Reinten-Reynolds T & Hardy L 2011, 'Changes in active travel of school children from 2004 to 2010 in New South Wales, Australia' *Preventive Medicine,* 53 pp408–410.

Figure 2.4 Car travel to school by school students in New South Wales, 1971 to 2010




Source: Rissel, Chris, University of Sydney Prevention Research Collaboration (unpublished) compiled from analysis of NSW household travel survey data and other data published in: Meron D, Rissel C, Reinten-Reynolds T & Hardy L 2011, 'Changes in active travel of school children from 2004 to 2010 in New South Wales, Australia', *Preventive Medicine,* 53 pp408–410; Van der Ploeg HP, Merom D, Corpus G & Bauman A 2008, 'Trends in Australian children travelling to school 1971–2003: burning oil or carbohydrates?' *Preventive Medicine,* 46 pp60–62.

Note: The survey period and questions changed for 2004 and 2010. The 1971–2003 survey measured travel over a single day. The 2004 and 2010 surveys measured last week's travel.

Despite these broader long-term trends, many interventions have resulted in substantial increases in the number of students walking or riding to school at individual schools or communities across Australia. Many schools and local governments across Australia coordinate a 'Walking School Bus' and/or 'bike bus', where parents walk along a predetermined route to school and pick students up along the way. This is often supported by state government departments of health and transport.[38, 39]

The annual National Walk to School Days and Ride to School Days have built on the individual efforts of schools to encourage more students to walk and ride safely to school. In March 2012 Trinity Beach State School in Cairns made a Guinness World Record when 639 students, staff, parents and friends rode the regular 'bike bus' to school for Ride to School Day.

## Travel distance

Even though the proportion of people walking or riding is relatively small compared with other modes of travel, almost 200 000 people walk and 55 000 ride every day to work or study in our capital cities.[40]

Of those adults who walk or ride as their main mode of travel, the two most common reasons for doing so are proximity of their home to work or study (64 per cent) and exercise and health (50 per cent). Distance is by far the most commonly reported reason for not walking (71 per cent) or riding (45 per cent) to work or full-time study.[41]

38 WA Department of Transport, Walking School Bus Program, http://www.transport.wa.gov.au/activetransport/24619.asp. Accessed 29 August 2012.
39 VicHealth, Walking School Bus Program, http://www.vichealth.vic.gov.au/wsb. Accessed 29 August 2012.
40 ABS 2006, *Census of Population and Housing* 2006.
41 ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, tables 15–17.

Figure 1.4 above compared cars, public transport, walking and riding, showing the proportion of commuter journeys that are under five or 10 kilometres. It showed that most walking trips are under two kilometres; half of cycling commuter trips are under five kilometres and another third are under 10 kilometres. A fifth of car commuting journeys are under five kilometres and another fifth are under 10 kilometres.

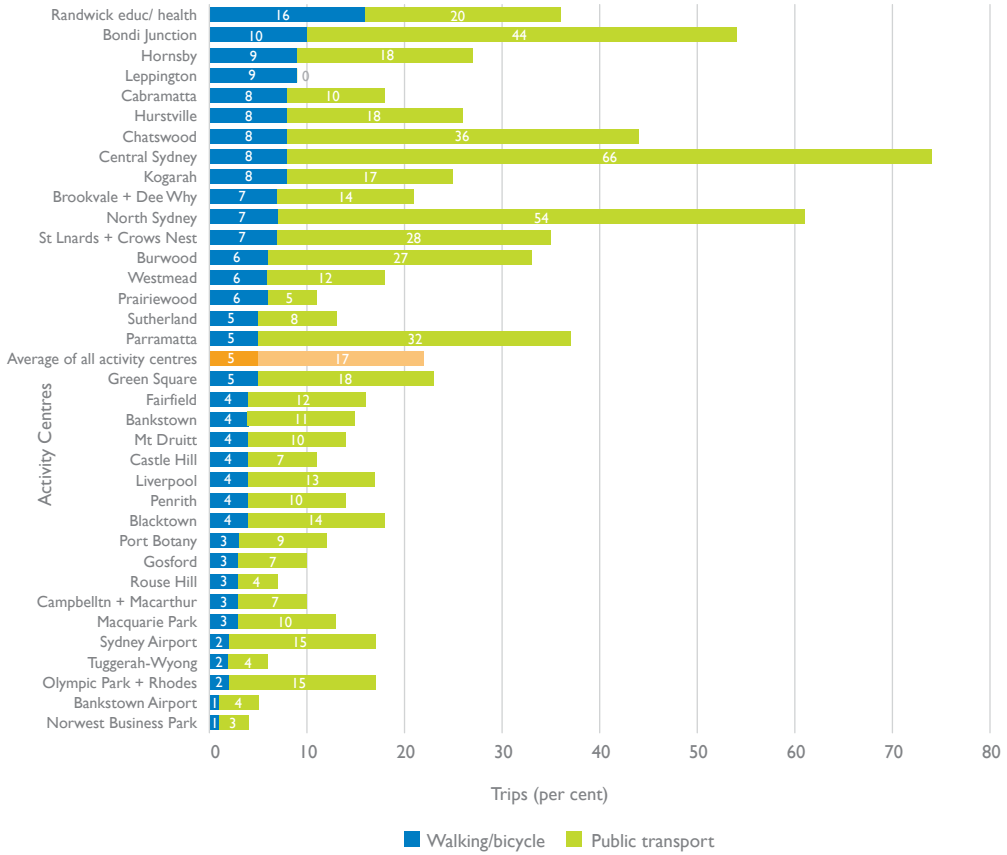
## Location

The location of people's housing and jobs within our cities influences their likelihood of walking, riding or catching public transport.

Figure 2.5 shows a great deal of variation across the different activity centres of metropolitan Sydney. Two-thirds of commuters to the Sydney CBD take public transport, 1.0 per cent ride a bicycle and 6.7 per cent walk to work. Just over half of commuters to North Sydney take public transport, 0.6 per cent ride and 6.4 per cent walk.

At the other end of the spectrum, locations such as Bankstown Airport and Norwest Business Park exhibit much lower proportions of both public transport and active transport, with around 96 per cent of commuters arriving by car.[42]

### Figure 2.5 Share of commuter walking, riding and public transport trips in Sydney, by activity centre




Source: BITRE 2012, analysis of NSW Bureau of Transport Statistics compilation of 2006 Census data, unpublished.

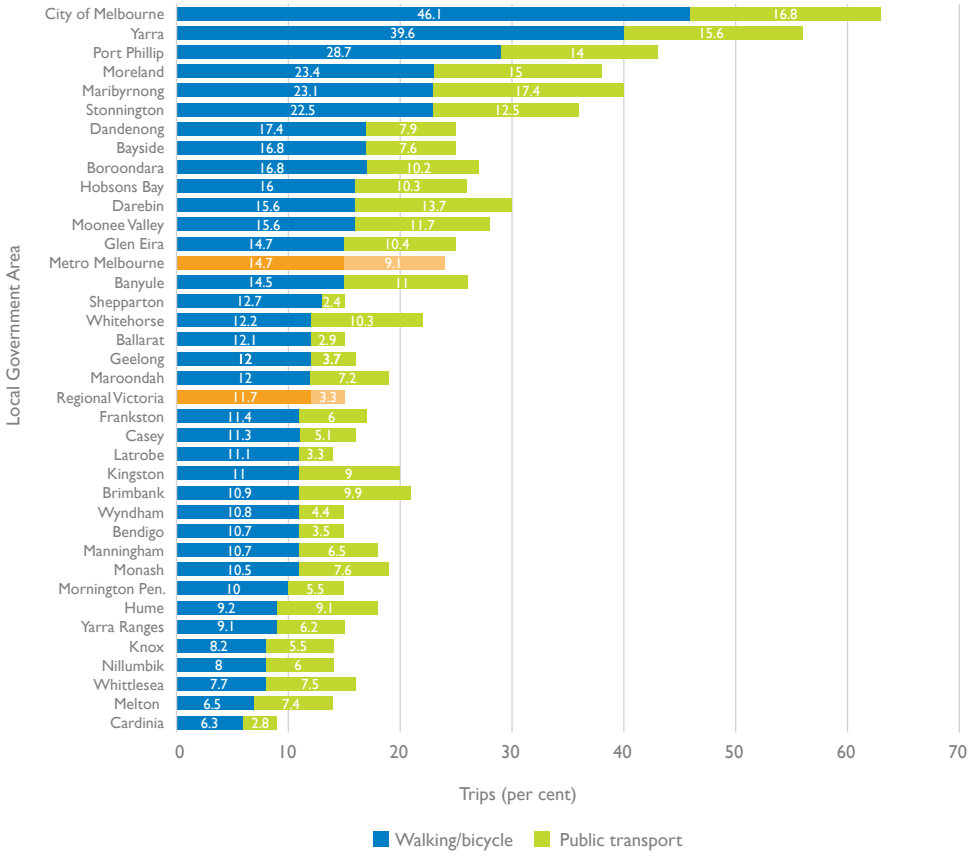
42 BITRE 2012, analysis of NSW Bureau of Transport Statistics compilation of 2006 Census data, unpublished.

## Non-commuter travel

Quite different travel patterns are observed when analysing all trips – in addition to those for work or study purposes. Walking accounts for 93 per cent of all internal trips undertaken within the City of Sydney[43] (see the case study in section 3.3 of this paper).

In Victoria, 9.1 per cent of all trips in the metropolitan area are by public transport and 14.7 per cent are by bicycle or on foot.[44] Up to 46.1 per cent of trips in the City of Melbourne are by bicycle or on foot and a further 17 per cent are by public transport (Figure 2.6).

### Figure 2.6 Share of all walking, riding and public transport trips in Melbourne, by local government area

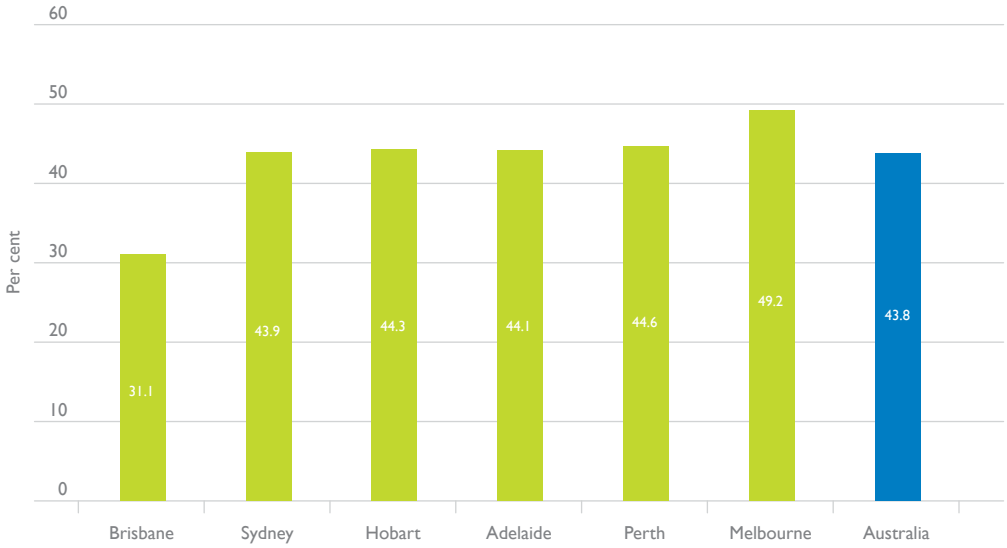



Source: Department of Transport, Victoria 2007, *Victorian Integrated Survey of Travel and Activity.*

43 City of Sydney 2012, *Connecting our city: transport strategy and actions.* Sydney 2030.
44 Victorian Department of Transport 2007, *Victorian Integrated Survey of Travel and Activity.*

A large proportion of non-commuting transport trips are walked: 43.8 per cent of Australian adults who live in a capital city walk for day-to-day trips other than to work or study (Figure 2.7). Again, this varies by location: nearly half of Melbourne residents walk regularly for non-commuting purposes compared with less than a third of Brisbane residents.[45]

Figure 2.7 Percentage of adults who walk for day-to-day trips, other than to work or full time study, by capital city




Source: ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002, table 6.

## 2.1.2 Who regularly walks?

Most Australians walk at some stage in their day. Figure 2.7 above shows that, in all the capital cities except Brisbane, at least four out of 10 adults walk for transport purposes other than to work or study. The same survey also found that, whilst only 4.2 per cent of the adult population walks as their usual form of transport to work or study, as many as 13.5 per cent sometimes walk as their alternative mode of travel to work or study[46] (refer back to Figure 2.3).

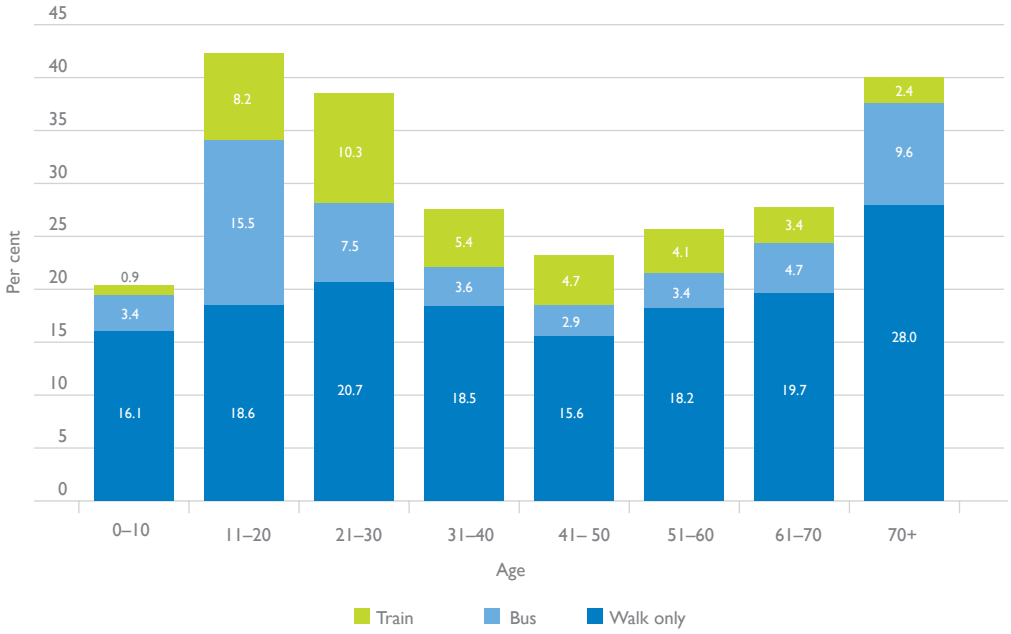
Levels of regular participation in walking differ across age groups. Figure 2.8 shows that, across Sydney, the 70-plus age group has the highest portion of walking-only trips, followed by the 21–30 age group and the 61–70 age group. The 11–20 age group has the highest overall portion of combined walking and public transport trips, while the youngest age group (0–10) has the lowest.

For some age groups, walking, riding and use of public transport are influenced by their ability to obtain a drivers licence or car. For example, a large proportion of the over 70 age group are women and many have never obtained a drivers licence or have since relinquished them. Similarly, those under 17 years of age are not old enough to obtain a drivers licence.

Ability to obtain a drivers licence and access to a car do not fully explain the high share of people in the 21–30 age group who walk, ride and use public transport. Other factors, such as residential location and lifestyle choices, may be influencing their decisions.

45 ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 6.
46 *Ibid.*, table 2 (main form of transport) and table 18 (alternative form of transport).

Figure 2.8 Average share of public transport and walk-only trips in Sydney, by age




Source: NSW Bureau of Transport Statistics 2011, *Sydney Household Travel Survey 2009/10.*

## Public transport users

Around 14 per cent of the adult population regularly uses public transport as their main mode of travel to work or study and a further 37.4 per cent sometimes uses public transport as an alternative.[47]

Studies have shown that public transport users tend to walk more than people who regularly drive to work (Figure 2.9). According to Lachapelle and Noland:

> *Transit commuters who walk or drive to transit stops walk more frequently outdoors than car commuters; this is partly because they walk to and from transit, but also because they conduct more walk trips for other purposes, near their homes and their work location. Those working from home did not walk more than those driving to work.*[48]

47 ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 2 (main form of transport) and table 18 (alternate form of transport).

48 Lachapelle U & Noland R 2012, 'Does the commute mode affect the frequency of walking behavior? The public transit link' *Transport Policy,* 21 p27.

Figure 2.9 Walking habits of various types of commuters


Source: Lachapelle U & Noland R 2012, 'Does the commute mode affect the frequency of walking behavior? The public transit link' *Transport Policy,* 21 p33. Survey asked, 'In the last 30 days, have you walked in order to ...?'

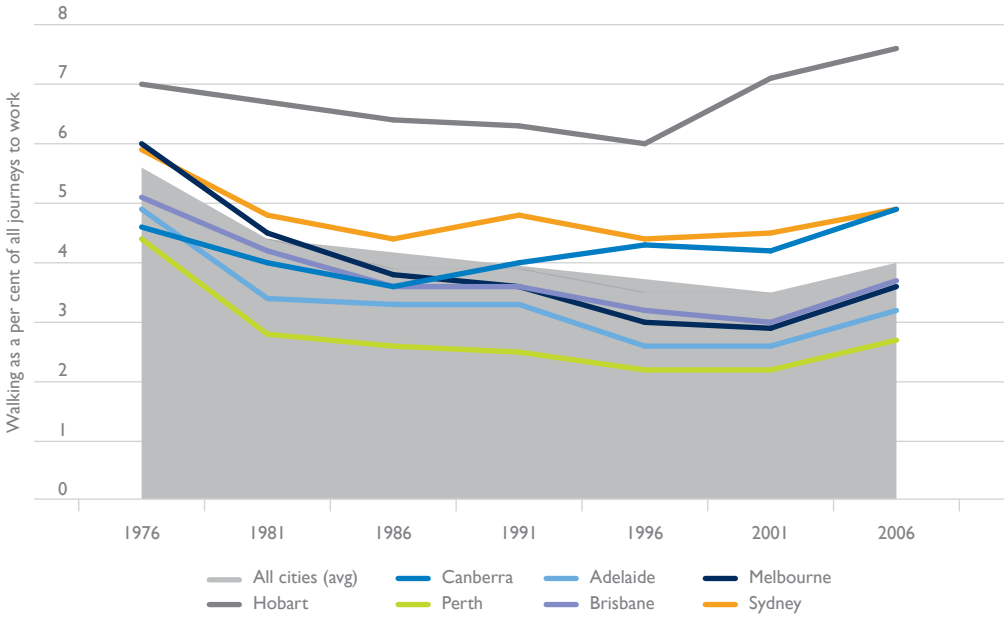
## Walking to work in capital cities

Hobart consistently has the highest proportion of people walking to work or study (7.6 per cent of the population in 2006) followed by Sydney (4.6 per cent in 2006) as illustrated in Figure 2.10.[49] Around 4.8 per cent of the population in Darwin (not shown in this chart) walks to work or study. Potential reasons for the variations across the capital cities are discussed in section 2.1.5 of this paper.

Whilst the proportion of people walking to work or study has dropped since the 1970s, Figure 2.11 shows that the overall number of pedestrians was similar in both 1976 and 2006, at around 200 000 trips per day.

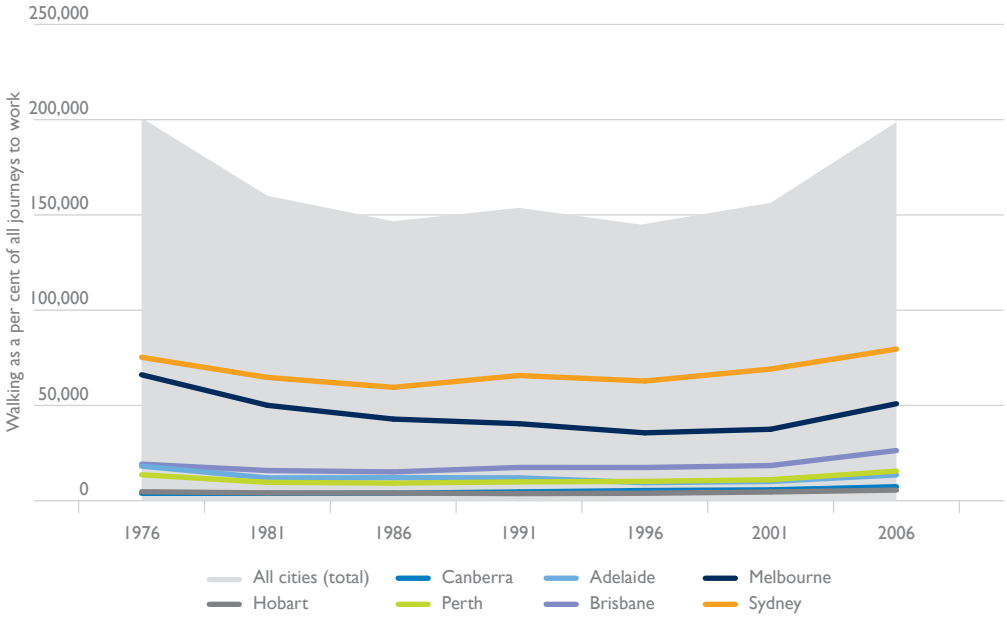
49 ABS 2009a, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002.

## Figure 2.10 Walking as a percentage of all trips to work, 1976–2006




Source: Mees, Sorupia & Stone 2007, *Travel to work in Australian capital cities, 1976–2006*: an analysis of Census data. Darwin not shown.

## Figure 2.11 Number of walking trips to work, 1976–2006




Source: Mees, Sorupia and Stone 2007, *Travel to work in Australian capital cities, 1976–2006: an analysis of Census data*. Darwin not shown.

## 2.1.3 Who regularly rides?

### Cycling participation in each state and territory

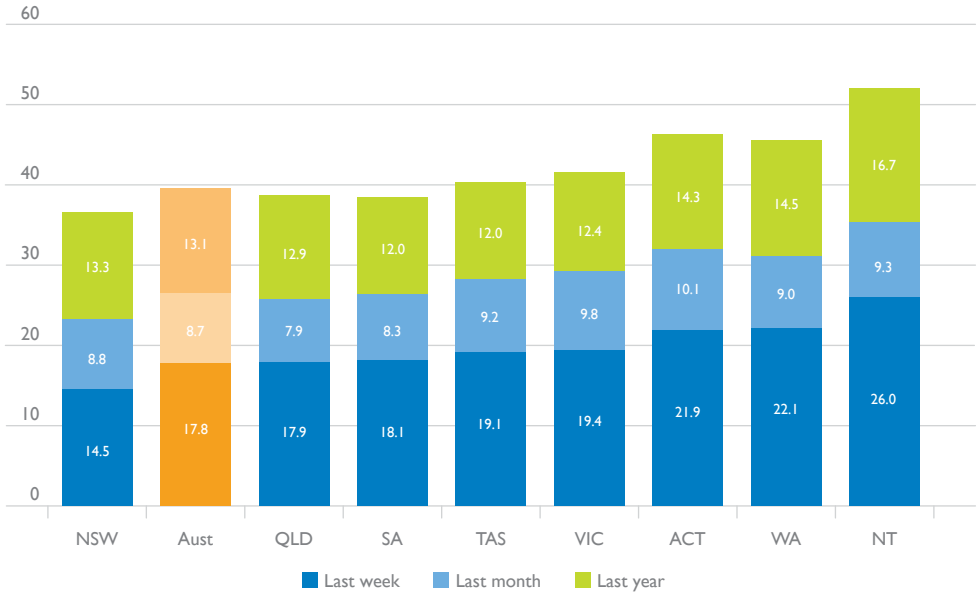
The 2011 *National Cycling Participation Survey*,[50] which surveyed 24 858 people around Australia, found that 17.8 per cent of the population had ridden a bicycle in the previous week and 26.5 per cent had ridden at least once in the previous month.

The survey presented cycling participation statistics for each state and territory, segmented into gender and age groups. Across all jurisdictions, males were more likely than females to have participated in riding, and children had a much greater participation rate than adults.

The survey found large variations between the states and territories. Figure 2.12 shows that New South Wales had the lowest proportion of people regularly riding a bicycle, with 14.5 per cent of the state population having ridden a bicycle in the last week, 23.3 per cent having ridden at least once in the last month and 36.6 per cent having ridden at least once in the last year.

At the other end of the spectrum, 26.0 per cent of people in the Northern Territory had ridden in the last week, 35.3 per cent had ridden in the last month and 52.0 per cent had ridden at least once in the last year. Western Australian and the Australian Capital Territory also had significantly higher participation than the national average.

Figure 2.12 Proportion of population that rode a bicycle in the last week, month or year



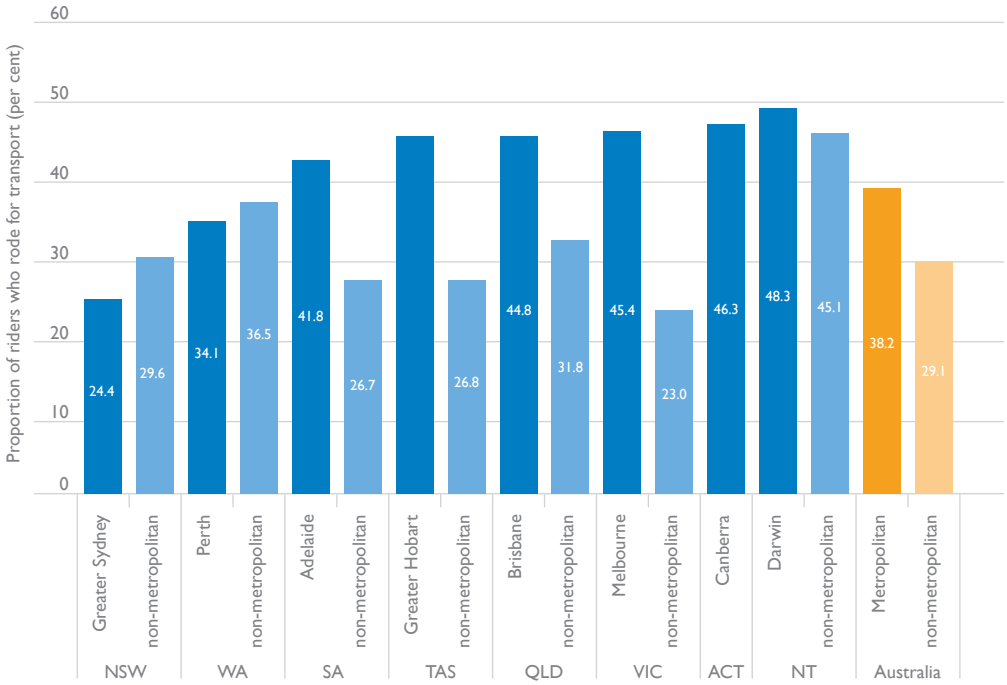

Source: Australian Bicycle Council 2011, *National Cycling Participation Survey.*

50 Australian Bicycle Council 2011, *National Cycling Participation Survey.*

Across Australia, of those who had ridden a bicycle in the last week, around 35 per cent had made at least one trip for transport purposes. The proportion was generally higher in capital cities: 38 per cent in the capital cities compared with 29 per cent in regional areas. Only New South Wales and Western Australia had a greater proportion of regional residents that rode for transport purposes (Figure 2.13).

Darwin, Canberra, Melbourne, Brisbane, Hobart and Adelaide all had a higher proportion of people that rode for transport purposes in the last week compared with the national capital city weighted average.

Figure 2.13 Of people who rode a bicycle in the last week, proportion that rode for transport purposes, by city or region

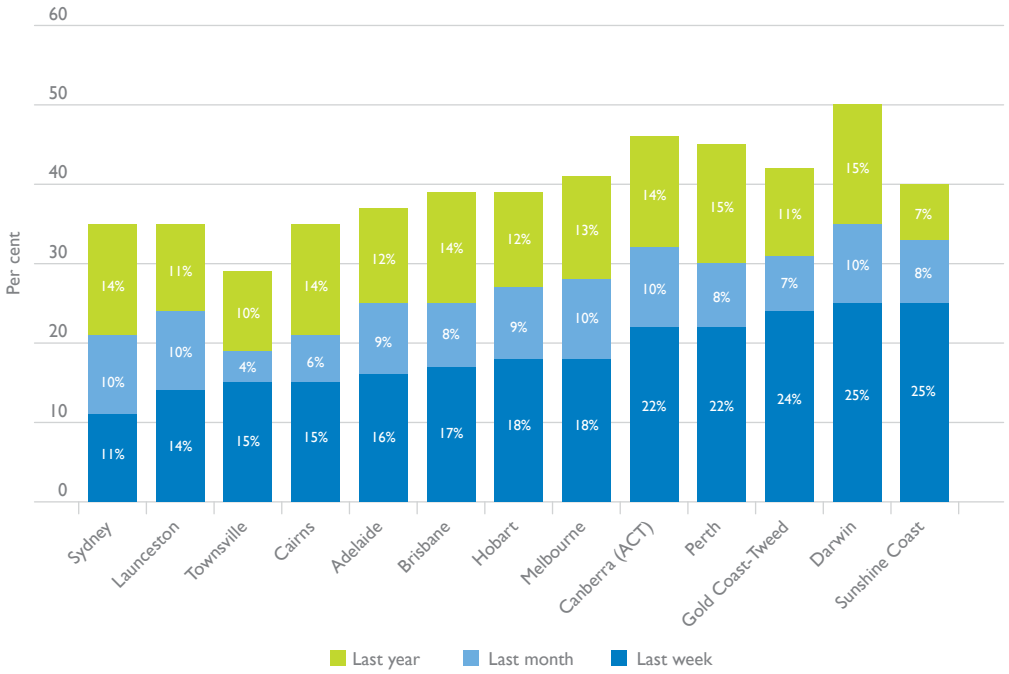



Source: Australian Bicycle Council 2011, *National Cycling Participation Survey.*

## Cycling participation in Australia's major cities

Of Australia's major cities, Darwin had the highest proportion of regular (weekly and monthly) bicycle riders, followed by Sunshine Coast and Canberra (Figure 2.14).

### Figure 2.14 Proportion of population that recently rode a bicycle, by city




Source: Adapted from data collected for the *2011 National Cycling Participation Survey.* Albury Wodonga, Geelong, Newcastle, Toowoomba and Geelong are excluded because of the small sample size.

Within cities, bicycle ownership tended to be highest in areas with a higher proportion of children[51] and bicycle riding was highest in inner city areas.[52]

## Riding to work or study in Australia's major cities

Averaged across Australia, only 1.5 per cent of the adult population rode a bicycle as their usual form of transport to work or study in the 2009. However, as much as 11.3 per cent said they rode a bicycle as their alternative mode of travel to work or study[53] (refer back to Figure 2.3).

The two figures below illustrate the proportion of people riding to work or study as their main form of transport. The figures show the variation between the capital cities over three decades from 1976 to 2006: most capital cities, except Adelaide, experienced very moderate growth in both mode share (Figure 2.15), and number of people riding (Figure 2.16).

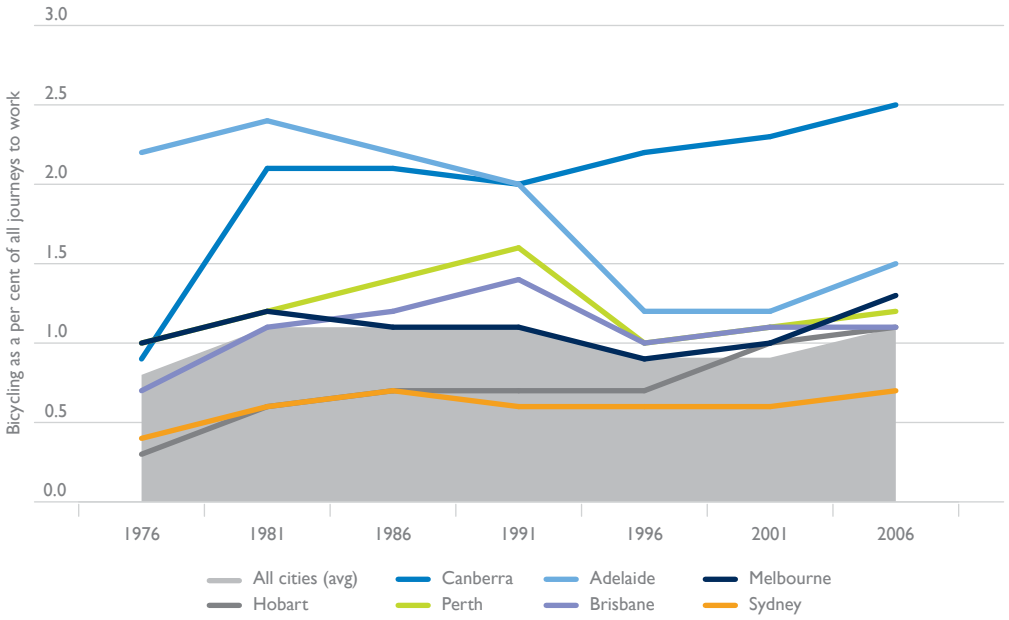
By 2006, Canberra had the highest mode share of bicycle trips to work as the main form of travel, while Melbourne had the most number of people, with nearly 20 000 people riding to work each day. Note that Darwin is not included in these charts.

51 Australian Bicycle Council 2011, *National Cycling Participation Survey.*

52 NSW Bureau of Transport Statistics 2011, *Sydney Household Travel Survey 2009/10*; Victorian Department of Transport, *Victorian Integrated Survey of Travel and Activity 2007*; Queensland Department of Transport and Main Roads, *South East Queensland Household Travel Survey 2009.*

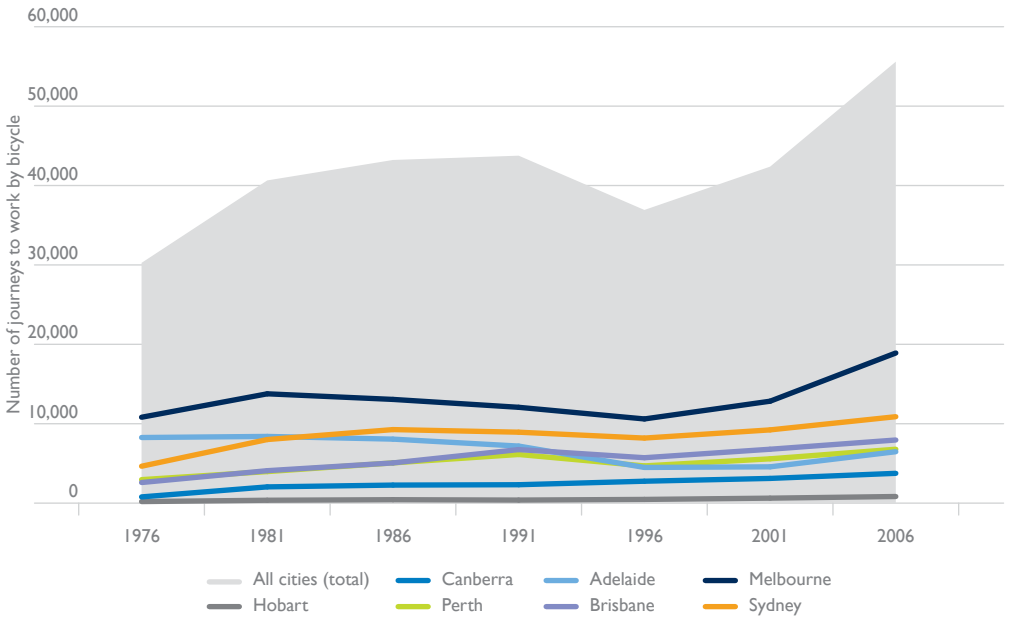
53 ABS 2009a, *Environmental Issues: Waste Management and Transport Use*, cat. no. 4602.0.55.002, table 2 (main form of transport) and table 18 (alternate form of transport).

Figure 2.15 Bicycling in capital cities as a percentage of all trips to work, 1976–2006




Source: Mees P, Sorupia E & Stone J 2007, *Travel to work in Australian capital cities, 1976–2006: an analysis of Census data.* Darwin not included.

Figure 2.16 Total numbers of journeys to work by bicycle in capital cities, 1976–2006

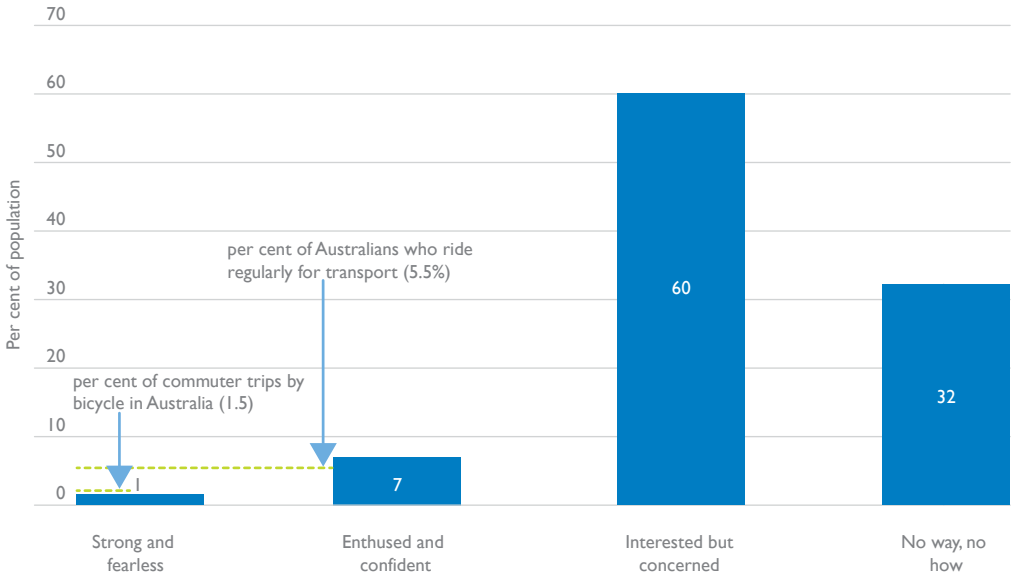



Source: Mees P, Sorupia E and Stone J 2007, *Travel to work in Australian capital cities, 1976–2006: an analysis of Census data*. Darwin not included.

## Types of bicycle riders

A paper on bicycle rider 'types' in Portland, Oregon, categorised people into four types: strong and fearless, who will ride a bicycle no matter what the conditions are (less than 1 per cent of the population); enthused and confident, who are likely to ride a bicycle given reasonable conditions (around 7 per cent of the population); interested but concerned (60 per cent), who require strong positive reinforcement and very good conditions in order to take up riding; and those who are unlikely to ever take up bicycle riding (around a third of the population). These four categories are illustrated in Figure 2.17.

### Figure 2.17 Four categories of bicycle riders




Source: Geller R (undated), *Four Types of Cyclists* www.portlandonline.com/transportation/index.cfm?a=264746&c=44597

Such categorisations are likely to be similar in Australia, where bicycle mode share makes up just 1.5 per cent of commuter journeys and 4.8 per cent of day-to-day trips other than to work or study.[54] About 5.5 per cent of all Australians ride a bicycle for transport purposes (not just commuting) on a weekly basis.[55] That is, our bicycle riders principally are representative of the 'strong and fearless' and to some extent the 'enthused and confident'.

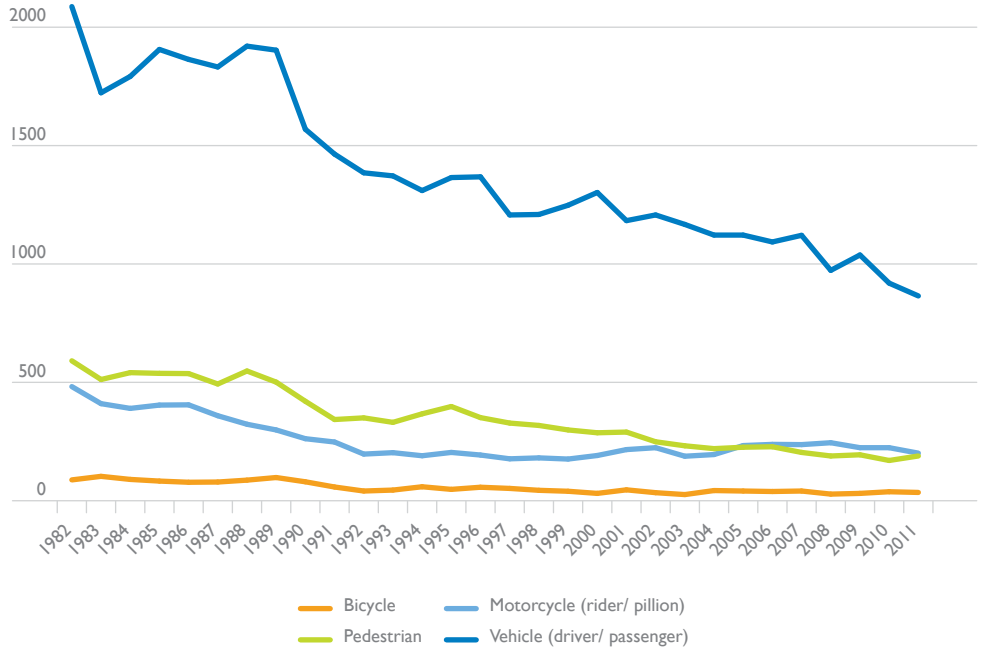
54 ABS 2006, *Environmental Issues: People's Views and Practices* cat. no. 4062.0, table 4.13. Totals adjusted to include all forms of transport.
55 Australian Bicycle Council 2011, *National Cycling Participation Survey.*

## 2.1.4 Safety

Concern about safety is one of the most significant barriers preventing people from riding a bicycle.[56]

Figure 2.18 shows that the number of road fatalities in Australia has dropped significantly over the past two decades for all road user types except motorcycles. This is despite an increase in the both population overall and the number of people walking and riding on a regular basis, as shown in Figure 2.11 earlier. Bicycle fatalities currently range between 30 and 40 a year (down from 80 to 100 a year in the early 1980s) and pedestrian fatalities range between 200 and 245 a year (down from 500 to 540 a year in the early 1980s).

Figure 2.18 Annual number of road fatalities by road user type, 1989–2011




Source: BITRE 2012, *Road Deaths Australia: 2011 Statistical Summary,* table 27.

Proportionally, however, the risk of serious injury or death is significantly higher, per kilometre travelled, for riding and walking than for car occupants.[57]

Age-related fatalities are likely to be exacerbated as the proportion of people aged over 65 increases. As noted by the OECD:

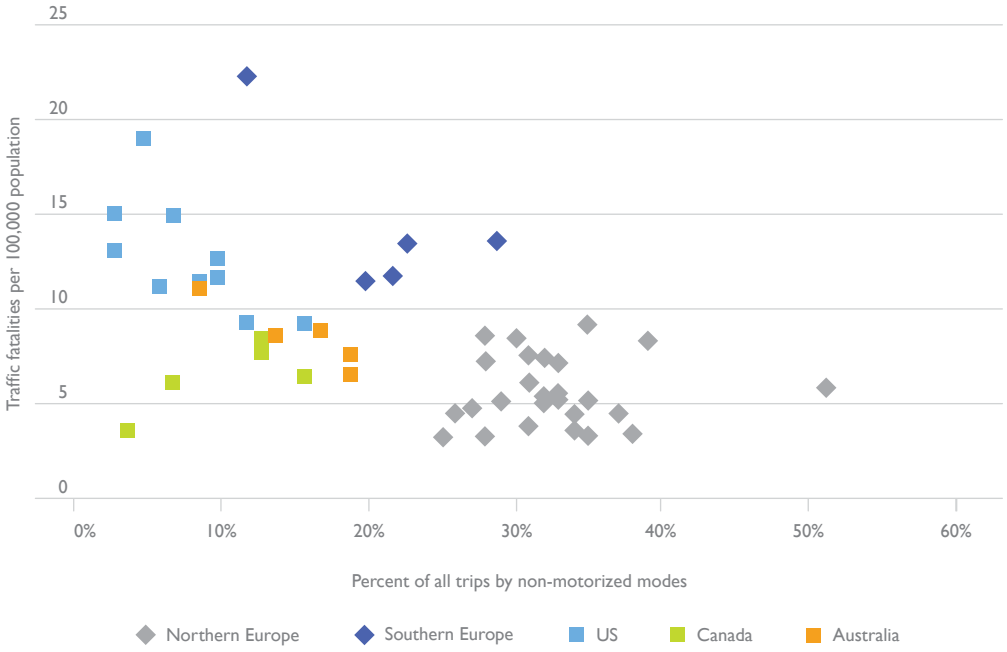
> *At any given time, around 30 per cent of pedestrians have impaired mobility (because they are overloaded, or have temporary or permanent health impairments). Because of the ageing of the population … public authorities must prepare for a future where a growing number of highly vulnerable people will be even more dependent on walking.*[58]

56 Cycling Promotion Fund 2008, *Cycling: Getting Australia Moving,* funded by the Australian Government Department of Health and Ageing, p18.
57 Austroads 2010, *The Road Safety Consequences of Changing Travel Modes.*
58 OECD 2011, International Transport Forum 2011, *Pedestrian Safety, Urban Space and Health: summary document*, p10.

## Safety in numbers hypothesis

Studies indicate a strong correlation between pedestrian and rider safety and their proportion of mode share[59] (Figure 2.19). An Australian study concluded that doubling bicycle travel reduces per-kilometre risk for bicycle riders by 34 per cent; and conversely, halving bicycle travel increases risk per kilometre by 52 per cent.[60]

### Figure 2.19 Traffic fatalities per 100 000 population compared with the proportion of non-motorised transport trips




Source: Litman T 2011, *Evaluating Non-Motorised Transportation Benefits and Costs*, Victoria Transport Policy Institute, quoting Kenworthy J and Laube F 2000, *An International Sourcebook of Automobile Dependence in Cities, 1960–1990.*

One theory behind this phenomenon is that a greater proportion of people riding or walking increases drivers' expectations that they will encounter pedestrians and bicycles. This expectation makes drivers more aware of their surroundings, resulting in safer driving behaviour. An alternative, or perhaps complementary, explanation is that people are more likely to ride in areas with safer infrastructure. The improved sense of safety gives walkers and riders more confidence and attracts more people to walking and riding. The increased demand necessitates further investment in infrastructure, skills and education and so on.

59 Austroads 2010, *The Road Safety Consequences of Changing Travel Modes*.
60 Litman T 2011, *Evaluating Non-Motorised Transportation Benefits and Costs,* Victoria Transport Policy Institute.

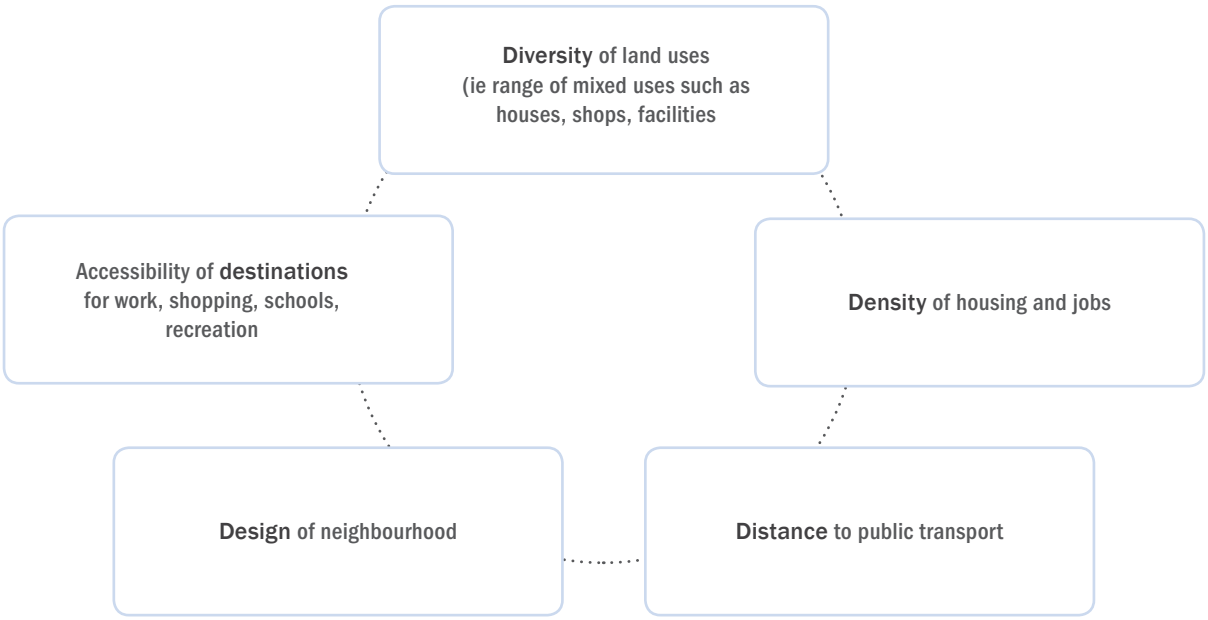
## 2.1.5 The influence of urban form and urban design

People are more likely to walk and ride in neighbourhoods that contain certain characteristics. There is extensive literature on this issue, including a number of citations in *Creating Places for People: an urban design protocol for Australian cities*[61] and *Healthy Spaces and Places*.[62] The House of Representatives report on obesity, *Weighing it Up,*[63] included recommendations for better urban design of our cities and suburbs to encourage more people to be physically active.

Factors that influence walking and riding include the provision of direct and continuous routes between key local places; paths that feel safe and pleasant to walk along; buildings and streetscapes that feel like they are the right size and type for that place; and a variety of things to do and see along the way.

A report published by the National Heart Foundation, *Increasing density in Australia*, assessed whether housing and employment density can affect public health. The paper included an illustration of the 'Five Ds' of land use planning that influence walking, riding and public transport use (Figure 2.20). It showed that the density of housing and employment underpins other factors that influence active transport, such as land use mix, accessibility and travel distance.

Figure 2.20 Planning factors that influence mode share of walking, riding and public transport ('Five Ds')




Source: Adapted from Giles-Corti B, Ryan K & Foster S 2012, *Increasing density in Australia: maximising the health benefits and minimising harm,* National Heart Foundation of Australia, Canberra.

61 *Creating Places for People: an urban design protocol for Australian cities* – see www.urbandesign.gov.au

62 Healthy Spaces and Places – see www.healthyplaces.org.au – a collaboration between the Australian Local Government Association, the National Heart Foundation of Australia and the Planning Institute of Australia, funded by the Australian Government Department of Health and Ageing.

63 Parliament of Australia, House of Representatives 2009, *Weighing it up: Obesity in Australia*.

Having a variety of different destinations close by increases people's likelihood of walking or riding. One study showed that, for each nearby destination, walking for transport increased by around six minutes per week.[64]

Density by itself does not increase walking and riding for transport. Rather, density makes access to local destinations, including public transport, more viable:

> *Low-density car-dependent cities discourage active living in particular walking, cycling and public transport use and encourage driving for activities of daily living. Studies repeatedly show that urban sprawl, as characterised by the low densities, curvilinear street networks and separated land uses of most US and Australian cities, decreases local walking and increases vehicle miles travelled. In turn, this increases sedentary behaviour. This is in contrast to the compact, higher density, well-connected neighbourhoods that increase walking, cycling and public transport use.*[65]

Creating a 'walkable neighbourhood', therefore, is more than a single-project or engineering solution. Land use mix and density, transport network planning, neighbourhood design and streetscape maintenance are all important considerations for ensuring mobility and access.

64 Giles-Corti B, Ryan K & Foster S 2012, *Increasing density in Australia: maximising the health benefits and minimising harm*, National Heart Foundation of Australia, Canberra, p31.

65 *Ibid.*, p29.

## 2.2 International experience

Australia falls well behind many other OECD countries in terms of walking and riding for transport purposes. In countries such as the Netherlands, Hungary and Denmark, a fifth of all daily journeys are made by bicycle, and in some cities the share is much larger.[66]

By comparison, Australia's mode share for cycling is 1.5 per cent of commuter journeys[67] and 4.8 per cent of day-to-day trips other than to work or study. This puts Australia in the range of the United Kingdom and Canada in terms of commuter share, marginally ahead of the United States.

The following section compares the experiences of the United States, the United Kingdom and Europe, where attempts have been made to improve mode share of walking and riding.

### 2.2.1 United States

In March 2010 the United States Department of Transportation announced its *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*.[68] The policy statement outlined the department's support for developing fully integrated active transport networks and stated that well-connected walking and bicycling networks should be a part of federal-aid project developments:

> *Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, the Department of Transportation encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate.*[69]

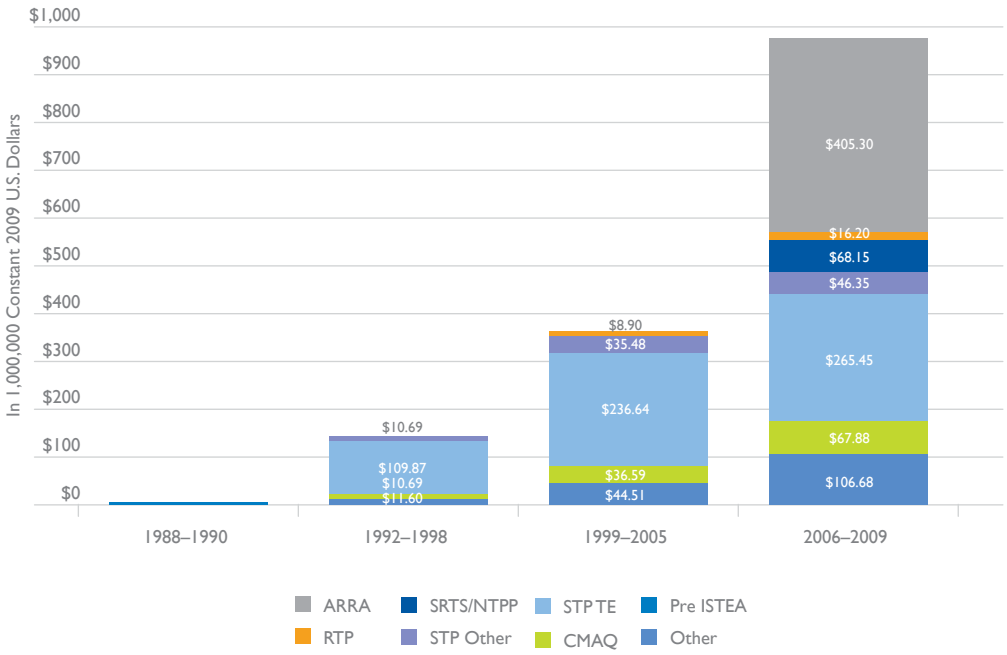
It encouraged states, local governments, professional associations, community organisations, public transportation agencies and other government agencies to adopt similar policy statements on bicycle and pedestrian accommodation.

It included *Prohibition of Route Severance*, under which the Secretary has authority to withhold approval for projects that would negatively impact on pedestrians and bicycles.

66 European Commission 2011, *Future of Transport: analytical report*, Flash EuroBarometer 312.
67 ABS 2006, *Environmental Issues: People's Views and Practices*, 4602.0, table 4.
68 United States Department of Transportation 2010, *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*.
69 *Ibid.*

Federal funding for walking and bicycling in the United States has increased significantly since 1990. This investment is across a number of different federal transport programs, as illustrated in Figure 2.21.

Figure 2.21 Inflation adjusted average annual US federal obligations for walking and bicycling




Source: Pucher J and Buehler R, 2011, *Bicycling Trends and Policies in Large North American Cities*, prepared for US Department of Transportation, Research and Technology Innovation Administration.

Key: ARRA (*American Recovery and Reinvestment Act*); RTP (Recreational Trails Program); SRTS/ NTPP (Safe Routes to School and Non-motorized Transportation Pilot Programs); STP TE (Surface Transportation Program – Transportation Enhancement Activities); STP Other (Surface Transportation Program – non TEA); CMAQ (Congestion Mitigation and Air Quality Improvement Program). See www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/bp-broch.cfm for further program details.

States and Metropolitan Planning Organisations (mandated for all urbanised areas of more than 50 000 people) are required to carry out comprehensive transportation planning, including 20-year transportation plans that incorporate pedestrian and bicycle facilities and three-year Transportation Improvement Programs for proposed federally supported projects.[70]

In addition, the Bicycle and Pedestrian Program of the Federal Highway Administration[71] requires each state to have a Bicycle and Pedestrian Coordinator in its state department of transportation. The role of the coordinator is to promote and facilitate the increased use of non-motorised transportation, including to develop facilities for the use of pedestrians and bicycles along with public education, promotion and safety programs for those who use these facilities.

Such federal funding and coordination has helped cities like Portland, Oregon, to achieve significant increases in walking and bicycle riding.

70 United States Department of Transport, Federal Highway Administration 2010, Bicycle and Pedestrian Program, Overview www.fhwa.dot.gov/environment/bicycle_pedestrian/overview/bp-broch.cfm

71 United States Department of Transport, Federal Highway Administration 2010, Bicycle and Pedestrian Program Home page www.fhwa.dot.gov/environment/bicycle_pedestrian/index.cfm

## Case study: Portland, Oregon (USA) – population 582 000

The city of Portland, Oregon, USA, has a population of 582 000 while the broader metropolitan area is 2.2 million. Portland has the highest bicycling mode share of any large city in the United States, but this was not always the case. In 1990 just 1.1 per cent of commuter trips were by bicycle. By 2000 it had increased to 2.1 per cent citywide and by 2011 it had increased to 6.4 per cent citywide. As of 2008 almost one-quarter of Portland's commuters lived in areas where the average bike commute mode share was more than 13 per cent.

'Portland is the American city that comes closest to implementing a truly comprehensive, well-integrated, long-term package of infrastructure, programs and policies to promote cycling.'[72]

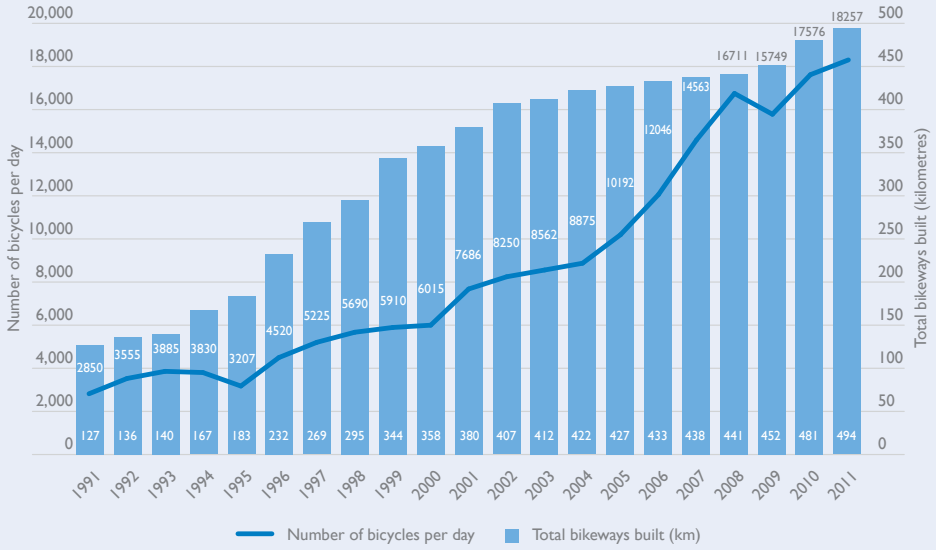
Portland's first *Bicycle Master Plan* was adopted in 1996. Under this plan 466 kilometres of bicycle network were constructed by 2010 and a wide range of complementary programs were implemented. The chart below shows the correlation between the number of bikeways built and the increase in daily bicycle numbers along four of Portland's main bicycle bridges.

More recently, Portland's *Comprehensive Plan* has introduced the '20-minute neighbourhood', which encourages residences to be built within a short walk or bicycle ride to daily destinations such as grocery stores, schools, libraries, transit stations and parks. The Planning Commission recommends that planning should 'designate a set of current and future 20-minute neighbourhood centres and designate a set of corridors interconnecting these neighbourhood centres. Corridors connecting these centres should be priorities for separated bikeways'.[73]

The *Portland Bicycle Plan for 2030* aims to make riding a critical component of the city's overall transportation system and sets a target of 25 per cent bicycle mode share for all trips by 2030.[74]

The supporting infrastructure program has three broad scenarios: a moderate program, costing US$23 million; a high-level program, costing US$225 million, which would allow 80 per cent of Portland residents to live within 400 metres of a 'developed low-stress bikeway'; and a US$334 million world-class program, which would establish bicycle infrastructure as an essential element of the urban streetscape – with high-quality separated in-roadway bikeways, such as cycle tracks and buffered bicycle lanes.

All three scenarios would be accompanied by maps and trip planning tools, a SmartTrips program (similar to TravelSmart in Australia – see Appendix D), community events, tax credits for businesses, training programs and a Safe Routes to Schools programs.




Source: *Portland Bike Count* 2009 (http://bikeportland.org/wp-content/uploads/2010/01/bikecount2009reportfinal.pdf), adapted from miles to kilometres.

72 Pucher J & Buehler R 2011, *Analysis of Bicycling Trends and Policies in Large North American Cities*, Virginia Tech.
73 City of Portland Oregon 2011, *Portland Bicycle Plan for 2030*, p22.
74 *Ibid.*, p126.

Local governments in many US cities have recently demonstrated shifts in thinking about their transport systems. The city of New York, for example, has undergone a dramatic transformation, as described in the case study below.

## Case study: New York city (USA) – population 8 245 000

New York has recently undertaken many quick, low-cost improvements to its streets in order to improve the quality of its public spaces; increase the attractiveness of walking and riding; and improve safety.

Three of the most publicised projects are the New York High Line – the installation of bicycle lanes throughout the city – and the transformation of Times Square from a major traffic route into a public square.

Before 2008, Times Square was a major vehicle route through the centre of Manhattan. Although 86 per cent of people travelling through Times Square were pedestrians, they had only 11 per cent of the available public space. This was changed almost overnight with the application of paint, pot plants and deck chairs.

The pilot program to reroute traffic away from Broadway at Times and Herald squares simplified intersections and created two new pedestrian plazas. Other changes included alterations to road geometry, shorter crossings and changes to parking regulations.

The objective was to reduce traffic congestion and improve journey times while improving safety for pedestrians – for example, the removal of long crossings across wide diagonal intersections.

Countermeasures in the surrounding area resulted in overall improvements to vehicle traffic flows. Travel times for taxis and buses have decreased by up to 15 per cent and the number of injuries to motorists and passengers has reduced by 63 per cent.

The expansion of pedestrian space has reduced the proportion of pedestrians overspilling from the footpaths onto the road space by 80 per cent in Times Square, reducing the number of injuries to pedestrians by 35 per cent.

The number of pedestrians travelling along Broadway and 7th Avenue in Times Square has increased by 11 per cent and at Herald Square by 6 per cent.[75] The new Times Square is used by more than 365 000 people every day.


The transformation has also increased surrounding property values. Since 2009, rents for street-level stores along the plaza have doubled – despite the recession – and Times Square was recently named one of the top ten retail locations in the world.

Fifty similar neighbourhood plazas are planned throughout the five boroughs of New York City with the aim of transforming underused local streets into vibrant public spaces.

In addition to these measures to improve public space and walkability, the city has installed more than 430 kilometres of bike lanes since 2007. The number of New Yorkers riding to work or school has doubled since then.

75 New York City Department of Transportation 2010, *Green Light for Midtown evaluation report*. New York City Department of Transportation.

## 2.2.2 United Kingdom

The United Kingdom, which has historically had similar rates of bicycle mode share to Australia, has experienced significant increases in bicycling over the past few years.

The 1999 Finance Act introduced an annual tax exemption, allowing employers to loan bicycles and safety equipment to employees as a tax-free benefit. The exemption was one of a series of measures introduced under the Government's Green Transport Plan.[76]

In 2005 the level of funding for cycling initiatives in English local authorities was around £1 (AU$1.60) per citizen per year. By contrast, European towns and cities that had successfully increased cycling levels had been spending around £10 to £20 ($16 to $32) per year for many years.[77]

Since then a number of programs and initiatives in the United Kingdom have been targeted at increasing walking and riding mode share.

In 2005 the Department of Transport funded a three-year program for six Cycling Demonstration Towns. Its aim was to encourage 'more people to cycle, more safely and more often' using a mix of infrastructure and promotion. The program had a benefit–cost ratio of 3:1 (including health benefits of 2.5:1); resulted in an average increase in cycling participation by 27 per cent; and doubled cycling to school.[78]

In 2008 the Department for Transport, Department of Health and Cycling England invested an additional £140 million (AU$220 million). Part of this investment extended the existing Cycling Demonstration Towns program for another three years, while £43 million (AU$68 million) was invested in 12 new urban areas under the Cycling City and Towns program – resulting in an average £16 (AU$25) per citizen per year with locally matched funding. A case study on one of these towns, Cambridge, is presented below.

An additional £74 million (approximately AU$120 million) will be spent on bicycle skills training over three years through the national Bikeability scheme.[79]

## 2.2.3 Continental Europe

Countries and cities across Europe are leading the world in walking and riding mode share. The city of Groningen (population 170 000) in the Netherlands, for example, leads the developed world, with 57 per cent of residents choosing to travel by bicycle for transport purposes.

A 2010 survey of 25 570 residents by the European Commission (Figure 2.22) found that, averaged across the European Union, walking and riding were the primary mode of transport for 20 per cent of residents (12.6 per cent walking and 7.4 per cent riding); public transport was used by 22 per cent of residents; and 55 per cent used a car or motorbike.

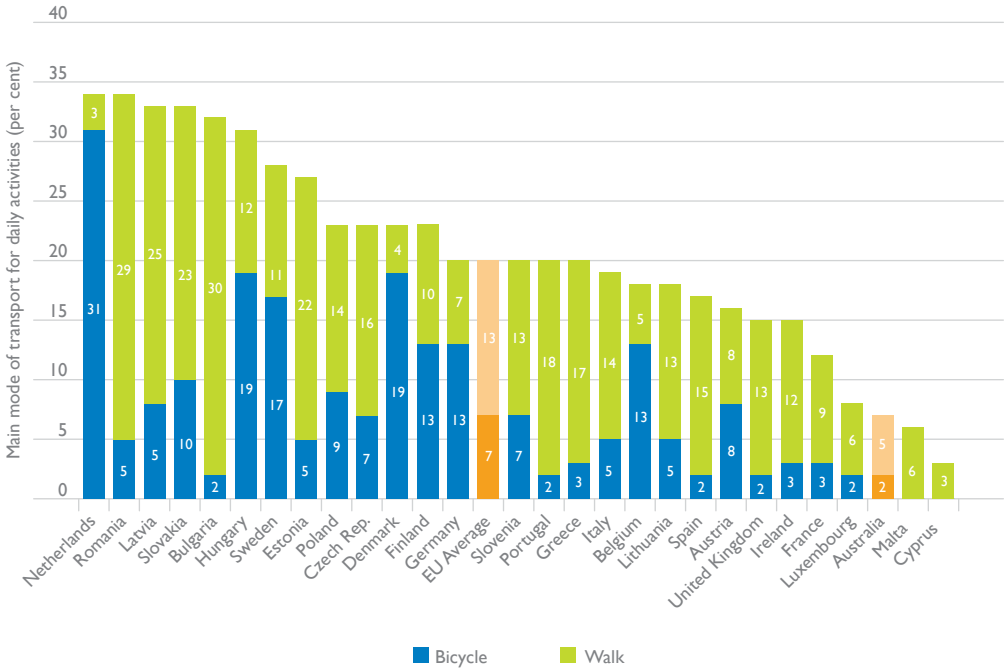
A third of respondents in the Netherlands, Romania, Latvia, Slovakia and Bulgaria said they got around on a daily basis by walking or riding.

The countries where cycling was most popular were the Netherlands (31 per cent mode share), Hungary (19 per cent), Denmark (19 per cent), Sweden (17 per cent), Belgium and Germany (13 per cent).

The countries where walking was most popular were Bulgaria (30 per cent mode share), Romania (29 per cent), Latvia (25 per cent), Slovakia (23 per cent) and Estonia (22 per cent).

76 UK Department for Transport 2011, *Cycle to work scheme – Implementation guidance.*
77 UK Department for Transport 2011, *Evaluation of the Cycling Cities and Towns Programme: interim report,* p12.
78 UK Department for Transport 2011, *Evaluation of the Cycling Cities and Towns Programme: interim report.*
79 UK Department for Transport 2012, *Bikeability: 'cycling proficiency' for the 21st Century, available from* http://www.dft.gov.uk/bikeability/

Figure 2.22 Main mode of transport used for daily activities by country, Europe




Source: European Commission 2011, *Future of Transport: analytical report,* Flash EuroBarometer 312. Question D7, 'What is the main mode of transport that you use for your daily activities?'; Australian data from ABS 2009, 4602.0 table 4, main method of travel to work or study. Note that these may not be directly comparable.

Not all European cities have been planned and built to facilitate walking and riding – many have been built or substantially expanded since the Second World War, with cars as the dominant mode of transport. However, several cities are now working to increase walking and riding mode share. They are achieving this through concerted efforts to build comprehensive, separated and direct physical networks; and encouraging greater uptake using education and media. One such example is the city of Seville in Spain, which built 120 kilometres of cycle lanes at a cost of €32 million (AU$41 million); initiated a bicycle share scheme; and underwent a large-scale public message campaign. Daily bicycle trips increased from 6600 in 2006 to 68 000 in 2009. This represents around 6.6 per cent of all traffic movements in the city, which is more than the underground metro.[80] In 2010 the program was awarded a UN-HABITAT best practice award.[81]

80 Ringham R 2011, 'Revolution! The story of cycling success in Seville', *Cycling mobility,* 1 pp 72–79, available from www.gmptehealthandtransportgroup.co.uk/news/The-story-of-cycling-success-in-Seville-Jan-2011.pdf. Voorn S 2011, *The cycling challenge: cases of Copenhagen and Sevilla,* European Metropolitan Network Institute (EMI), available from www.emi-network.eu/Research/Sustainable_urban_mobility/News_publications/The_cycling_challenge_cases_of_Copenhagen_and_Sevilla

81 UN HABITAT 2010, Best Practice Details ESP103-10 Cycle-lane network in the city of Seville-Spain-Europe, available from www.unhabitat.org/bp/bp.list.details.aspx?bp_id=846

# CHAPTER 3
# Economic analysis

This chapter analyses the economic benefits of walking and riding, including improvements to public health, reductions in traffic congestion and improvements to environmental and community outcomes. The final section (section 3.7) provides a summary of construction costs and the net results of cost–benefit analyses for walking and riding programs around Australia and internationally.

## 3.1 Benefit analysis of walking and riding

Over the past three years a number of economic appraisals of bicycling and walking related infrastructure have been undertaken, including for projects in Sydney, Melbourne and South East Queensland.

*Benefits of inclusion of active transport in infrastructure projects,* commissioned by the Queensland Department for Main Roads in 2011,[82] assessed a wide range of location-specific projects and provided a basis for assessing generic active transport projects. The study found that, for a typical off-road path located in an inner urban area:

- 1000 pedestrians per day will generate discounted benefits of around $7 million over a 30-year appraisal period ($2.12 per kilometre walked)
- 1000 bicycle riders per day will generate discounted benefits of around $15 million over a 30-year appraisal period ($1.43 per kilometre cycled).

82 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC.

This is predicated on the per kilometre benefits for a typical project (where no location has been specified), in 2010 figures, shown in Figure 3.1:

Figure 3.1 Benefits per kilometre travelled for walking or riding, for an average project

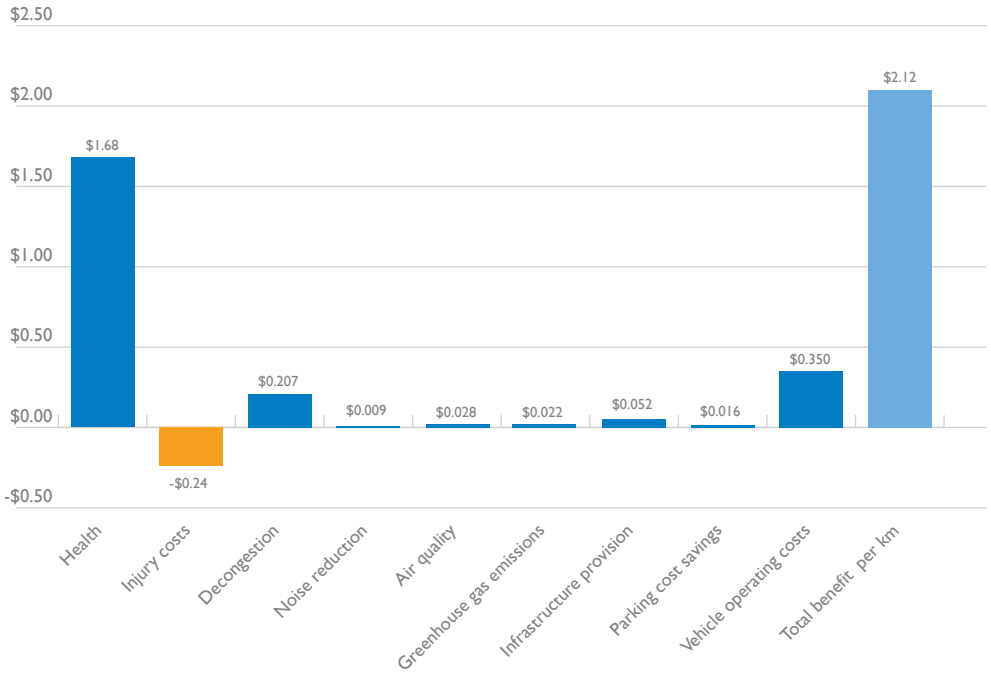
| Benefit | Value ($/km) | Lower bound | Upper bound |
|---|---|---|---|
| Health (walking) | $1.680 | $1.230 | $2.500 |
| Health (riding) | $1.120 | $0.820 | $1.670 |
| Injury costs (walking) | -$0.240 | | |
| Injury costs (riding) | -$0.370 | | |
| Decongestion | $0.207 | $0.060 | $0.340 |
| Noise reduction | $0.009 | $0.007 | $0.012 |
| Air quality | $0.028 | $0.028 | $0.029 |
| Greenhouse gas emissions | $0.022 | $0.020 | $0.025 |
| Infrastructure provision | $0.052 | | |
| Parking cost savings | $0.016 | | |
| Vehicle operating costs | $0.350 | | |
| **Total benefit (walking)** | **$2.12** | | |
| **Total benefit (cycling)** | **$1.43** | | |

Source: Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC, table EX.1: benefits summary.

The following two figures chart these benefits for walking (Figure 3.2) and riding (Figure 3.3). They show that health benefits make up around 80 per cent of the net benefits of both modes of travel. They also show that, although there are injury costs associated with both walking and riding, these are significantly outweighed by the health benefits gained.

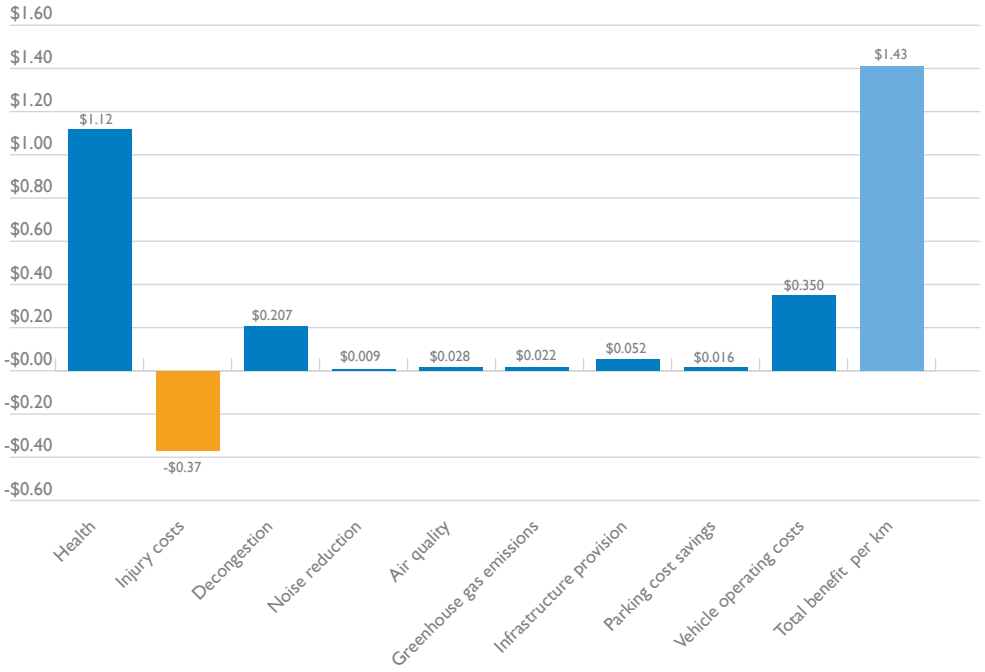
The following sections discuss each of these benefits in more detail.

Figure 3.2 Benefits per kilometre travelled for walking, for an average project




Source: Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, table EX.1: benefits summary.

Figure 3.3 Benefits per kilometre travelled for riding, for an average project




Source: Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC, table EX.1: benefits summary.

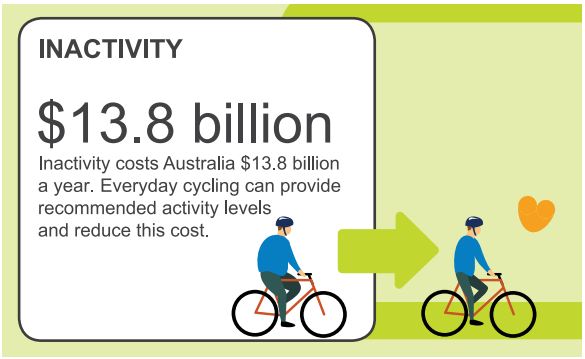
## 3.2 Health

Evaluations of active travel projects have shown that health factors are the most significant benefits of walking and riding. Although increasing participation will also lead to injuries, it is clear from the analysis that the public health benefits of good-quality walking and riding infrastructure significantly outweigh associated injury costs. The net health benefit (adjusted for injury) for each kilometre walked is 144 cents – about 70 per cent of the total economic benefits of a walking project. The net health benefit (adjusted for injury) for each kilometre cycled is 75 cents – about half of the total economic benefits of a typical bikeway project.[83]

| Benefit | Value (per km) | Lower bound | Upper bound |
|---|---|---|---|
| Health (walking) | 168 cents | 123 cents | 250 cents |
| Injury costs (walking) | - 24 cents | | |
| **Net health benefit (walking)** | **144 cents / km** | | |
| | | | |
| Health (riding) | 112 cents | 82 cents | 167 cents |
| Injury costs (riding) | - 37 cents | | |
| **Net health benefit (riding)** | **75 cents / km** | | |

Source: Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, table EX.1: benefits summary.

### Inactivity and related illness




The prevalence of overweight and obesity has been steadily increasing over the last 30 years in Australia and is correlated with increasingly sedentary lifestyles.[84] Over a third of Australia's adults are physically inactive. Australia is now one of the most overweight nations in the OECD, with over 60 per cent of adults and one in four children being overweight or obese.

In 2008 obesity was estimated to cost $58.2 billion to the economy[85] due to diseases like diabetes, cardiovascular disease, various cancers and osteoarthritis:

83 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, table EX.1: benefits summary.
84 ABS 2009, *National Health Survey 2007-08* (Reissue) cat. no. 4364.0.
85 Access Economics 2008, *The growing cost of obesity in 2008: three years on*, p20.

> *The total direct financial cost of obesity for the Australian community was estimated to be $8.3 billion in 2008. Of these costs, the Australian Government bears over one-third (34.3 per cent or $2.8 billion per annum), and state governments 5.1%. This estimate includes productivity costs of $3.6 billion, including short- and long-term employment impacts, as well as direct financial costs to the Australian health system of $2 billion and carer costs of $1.9 billion. The net cost of lost wellbeing (the dollar value of the burden of disease, netting out financial costs borne by individuals) was valued at $49.9 billion. Obesity was associated with over four million days lost from Australian workplaces in 2001.*[86]

Obesity is particularly prevalent among men and women in the most disadvantaged socioeconomic groups, people without post-school qualifications, Indigenous Australians and many people born overseas.[87]

Incorporating physical activity into travel has been identified as a highly effective means to increase daily physical activity. Active travel contributes to the overall physical activity participation rates of the Australian population and could help contribute further to Australia's national preventative health agenda.

The World Health Organization recommends that adults should do at least 150 minutes of moderate-intensity or 75 minutes of vigorous aerobic physical activity throughout the week.[88] It suggests that 'the main sources of health-enhancing physical activities encompass normal and simple activities such as walking [and] cycling'.[89]

Regular physical activity reduces the likelihood of coronary heart disease, strokes, hypertension and cholesterol; stress, anxiety and depression; overweight and obesity; type 2 diabetes; falls in the elderly (through strengthened muscles and joint stability); osteoporosis; and colon and breast cancer.[90] Giles-Corti et al have claimed:

> *The societal benefits of even a modest increase in those who are physically active could be large. A longitudinal study of Scandinavian adults found that mortality rates in workers who cycled to work were 28 per cent lower than others. Similarly, a Chinese study found a 20–50 per cent lower risk of premature mortality in women who regularly exercised or cycled for transportation. A British study identified that children who walked or cycled to school were fitter than those who travelled by bus or car, with fitness 30 per cent higher in boys who cycled and seven-fold higher in girls.*[91]

Another study in Spain found that, of those not meeting daily physical recommendations, 16 per cent of men and 14 per cent of women would meet those recommendations if they replaced at least one short motorised trip per day by walking.[92]

86 Australian Government 2009, *Australia: the healthiest country by 2020 – Technical Report No 1 – Obesity in Australia: a need for urgent action,* p6.
87 *Ibid.,* p1.
88 World Health Organization 2010, Global Recommendations on Physical Activity for Health.
89 World Health Organization 2006, Promoting physical activity for health: a framework for action.
90 Commonwealth Department of Health and Ageing 2008, *Cycling: getting Australia moving,* prepared by Cycling Promotion Fund.
91 Giles-Corti B, Foster S, Shilton T and Falconer R 2010, 'The co-benefits for health of investing in active transportation', *NSW Public Health Bulletin*, 21(5–6) p122.
92 Olabbarria et al 2012, 'Health impact of motorised trips that could be replaced by walking', *European Journal of Public Health*, June 2011, pp 1–6.

## Mental health and community cohesion

Regular outdoor activity improves community cohesion and mental health. Pedestrian- and cycling-friendly neighbourhoods can facilitate incidental social interaction between neighbours and foster social capital (that is, social networks, norms and trust) and increase casual surveillance of the street, which creates an improved sense of safety. Numerous studies show positive associations between social capital and physical and mental health.[93]

## Respiratory disease

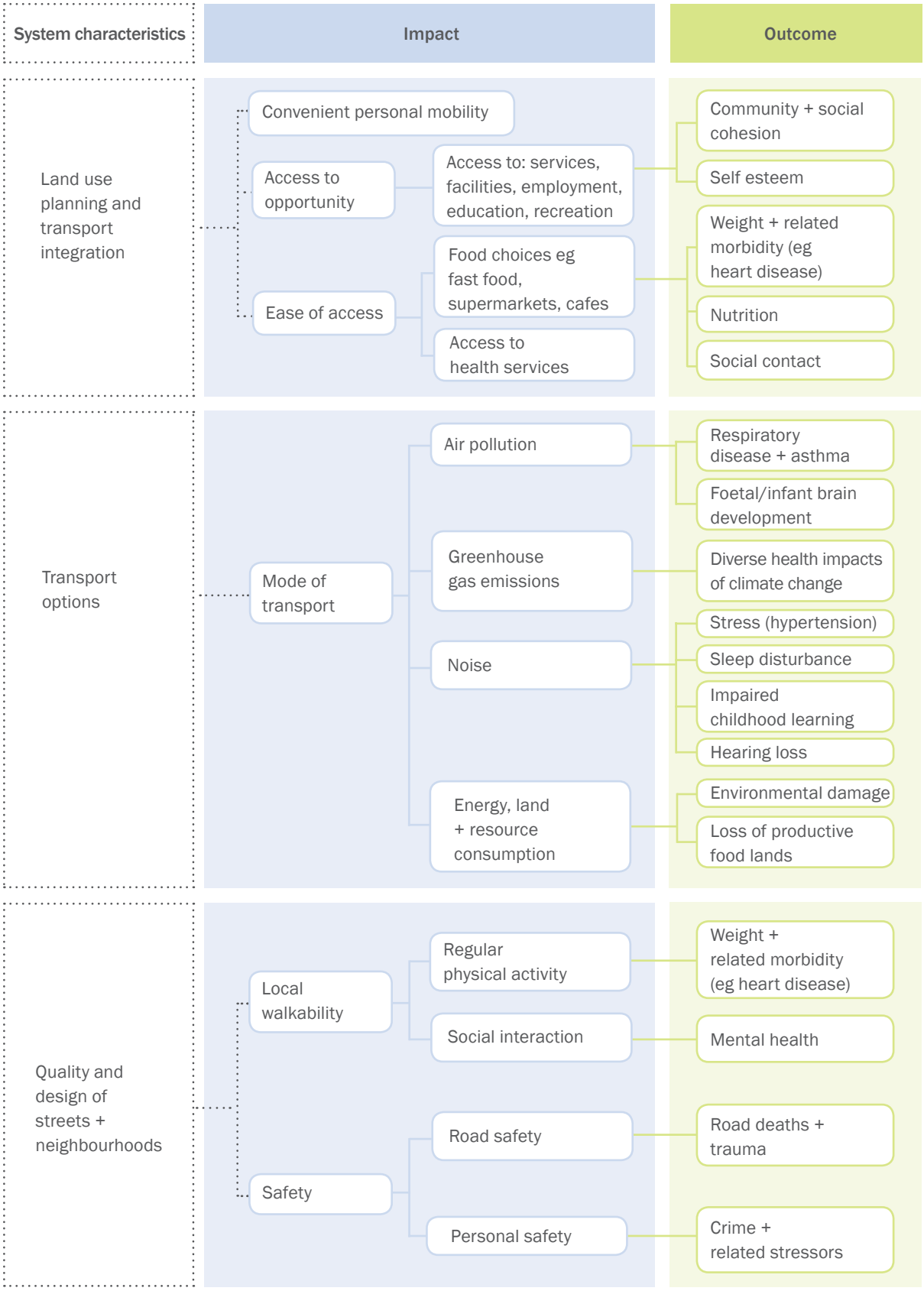
Cycling and walking produce minimal air pollution (linked to respiratory disease and asthma[94]) and noise pollution (linked to stress and sleep disturbance[95]) compared with other modes of travel.

Urban air pollution is estimated to account for 1 per cent of the disease burden in Australia and more than 3000 premature deaths, mainly among the elderly. It contributes to respiratory and cardiovascular diseases and cancer.[96] Air pollution exacerbates asthma – a major childhood illness in Australia. Motor vehicle air pollution is estimated to cause up to 4500 cases of respiratory and cardiovascular disease each year. The estimated cost of air pollution in Australian capital cities in 2005 was more than $2 billion.[97]

Figure 3.4 shows some of the interrelationships between transport systems and associated infrastructure, and their social and health impacts. It illustrates that there are complex links between public health, urban planning and transportation systems.

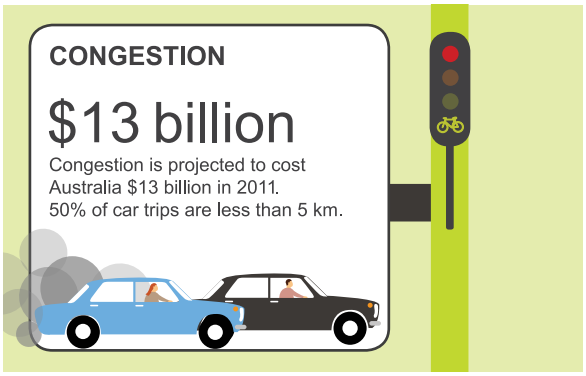
93 Giles-Corti B, Foster S, Shilton T & Falconer R 2010, 'The co-benefits for health of investing in active transportation' *NSW Public Health Bulletin*, 21(5–6) p123.
94 *Ibid.*, p122.
95 Brown A & Tomerini D 2011, 'Distribution of noise level maxima from the pass-by of vehicles in urban road traffic streams', *Road and Transport Research*, 2(3), pp50–63. ARRB Group Ltd.
96 Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) 2011, *State of the Air in Australia 1999–2008*, Canberra.
97 *Ibid*.

Figure 3.4 Linking transport systems and urban infrastructure with potential health impacts




Source: Adapted and amended from McMichael A 2008, 'The Urban Environment and Health' in Newton, 2008.

## 3.3 Traffic congestion




Australia's urban transport systems are struggling to cope with increasing numbers of trips, particularly during peak periods. Many arterial roads and urban motorways have little room for expansion. Likewise, many train and bus routes are operating at or beyond capacity during peak periods.

The avoidable costs of congestion are currently around $13 billion per year.[98] It is estimated that these costs could rise to $20.4 billion in 2020 if we continue to structure our urban transport systems as we do now. A sensitivity analysis was undertaken that modelled congestion costs under alternative scenarios. The analysis found that, if the mode share of public transport, walking and riding were to double, the avoidable congestion cost in 2020 could be reduced to about $15 billion. An opposite scenario, in which all riding, walking and public transport use is replaced by extra private car travel, could result in annual traffic congestion costs of around $28 billion by 2020.[99]

Traffic congestion in urban areas, and the consequent economic cost, is a central consideration. A shift to more walking or riding, particularly for short journeys, could add capacity to our roads and some strained inner-city public transport services. It could also help to improve the accessibility and effective reach of public transport networks, helping to further reduce congestion.

Figure 3.5 shows the comparative speed of different modes of travel in urban areas. Studies in Europe, the United States and Australia comparing the travel time of different transport modes has found that riding is often faster than driving for trips up to five kilometres, while walking is faster for trips of up to 400 metres.[100] This is partly because of the time it takes to walk to the car and exit a car park and partly because cars travel relatively slowly in built-up areas with a large number of intersections. Studies in both Sydney and Portland, Oregon, have found that trips of five kilometres take a similar amount of time by bicycle or by car, even for relatively slow or inexperienced riders.[101]

Depending on initial waiting times and walking distance to the nearest bus stop or train station, public transport is also significantly slower than walking for distances up to one kilometre and for riding a bicycle up to eight kilometres.

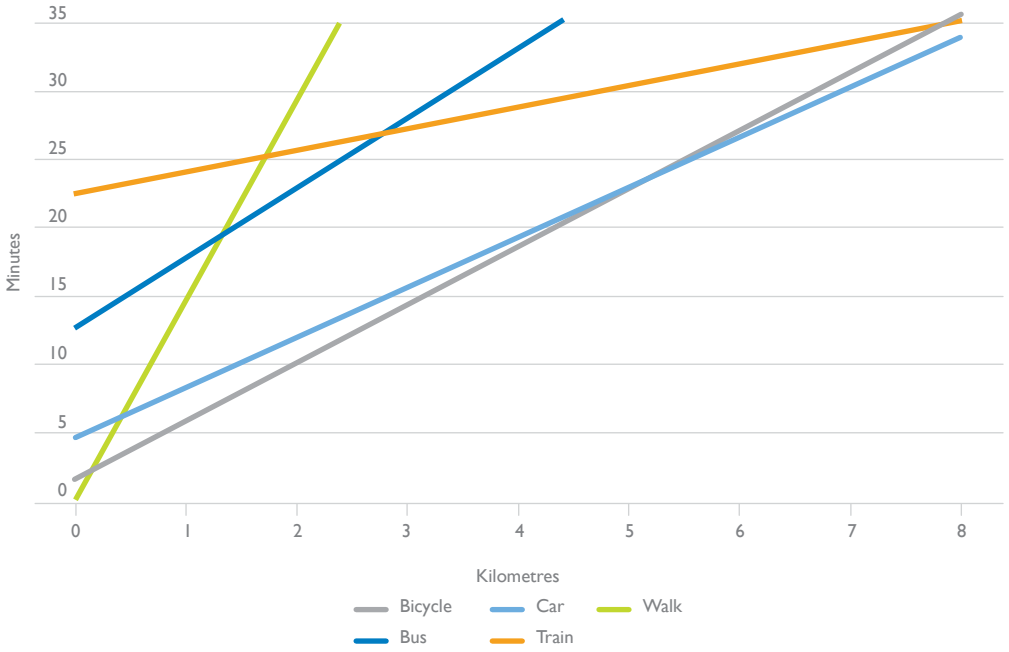
98 Bureau of Transport and Regional Economics (BTRE) 2007, *Estimating urban traffic and congestion cost trends for Australian cities*, Working Paper 71, Canberra.

99 BTRE 2007, *Estimating urban traffic and congestion cost trends for Australian cities*, p119.

100 Tranter P 2012, 'Effective Speed' in Pucher J and Buehler R (eds), *City Cycling*, MIT Press (forthcoming); Ellison R & Greaves S 2011, 'Travel time competitiveness of cycling in Sydney', Institute of Transport and Logistics Studies, Working Paper ITLS-WP-11-06, p2.

101 Ellison R & Greaves S 2011, 'Travel time competitiveness of cycling in Sydney', Institute of Transport and Logistics Studies, Working Paper ITLS-WP-11-06, p2.

Figure 3.5 Comparative journey speeds of travel modes in an urban environment




Source: NSW Government 2010, *Estimating the benefits of walking: a cost benefit methodology,* prepared for PCAL and DEECW by PwC. Chart appears in numerous other sources citing: European Commission 1999, *Cycling: the way ahead for towns and cities*, p 11.

The cost–benefit analysis discussed at the beginning of section 3.1 concluded that traffic decongestion benefits are worth around 20.7 cents per kilometre travelled for a generic active transport project – equivalent to 14 per cent of the benefits of a cycling project and around 10 per cent of the benefits for a walking-related infrastructure project.[102]

| Benefit | Value (per km) | Lower bound | Upper bound |
|---|---|---|---|
| **Decongestion** | **20.7 cents / km** | 6 cents | 34 cents |

Other benefits to consider in active travel infrastructure projects relate to the avoided comparable cost of constructing car parking and road infrastructure. In the benefit–cost analysis example referred to in section 3.1, the avoided cost of infrastructure provision equates to about 5.2 cents per kilometre and car parking equates to about 1.6 cents per kilometre. These figures would vary significantly depending on the project location.

| Benefit | Value (per km) |
|---|---|
| Infrastructure provision | 5.2 cents |
| Parking cost savings | 1.6 cents |
| **Total infrastructure savings** | **6.8 cents / km** |

102 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC, table EX.1: benefits summary.

Walking and riding also complement public transport. Most public transport journeys start and end with a walking trip. In South East Queensland, 75 per cent of all trips to public transport are by walking and bicycle.[103] An analysis of the Brisbane household travel survey has shown that walking to and from public transport adds up to two kilometres of walking per day for an average Brisbane commuter[104] – equivalent to 30 minutes of exercise.

People are far more likely to catch public transport if they have a safe and convenient walking route to the bus stop or rail station. Seventy per cent of people who drive to public transport in South East Queensland drive less than five kilometres because safe and convenient walking options are not available.[105]

103 Queensland Department of Transport and Main Roads 2010, analysis of South East Queensland Household Travel Survey data.
104 Burke M & Brown AL 2007, 'Distances People Walk for Transit', *Road and Transport Research,* 16(3) 17–29.
105 Queensland Department of Transport and Main Roads 2011, *Queensland Cycle Strategy.*

## Case study: Proportion of road space allocated to different road users

### Melbourne

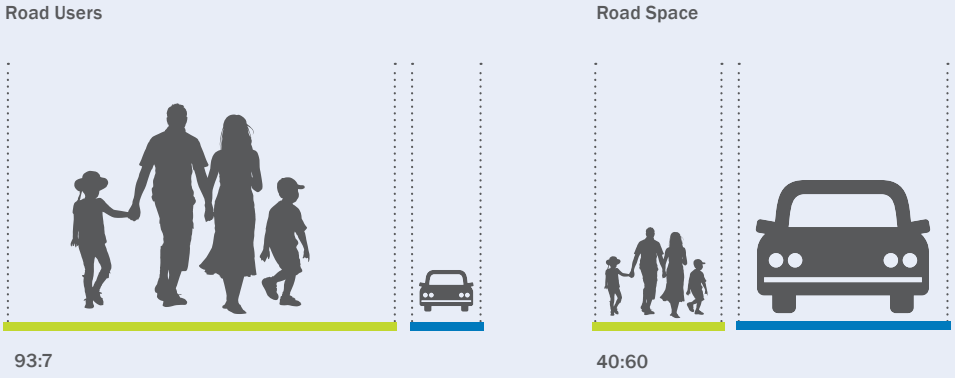
Melbourne's Swanston Street was once a major thoroughfare for vehicles, linking the north and south of the CBD.

In the 1980s and 1990s, the City of Melbourne and the Victorian State Government moved to reduce traffic travelling through the middle of the city. They also created a street heirarchy to give greater consideration to other road users. Swanston Street was closed to through traffic and the footpaths were significantly widened to accommodate for higher numbers of pedestrians.

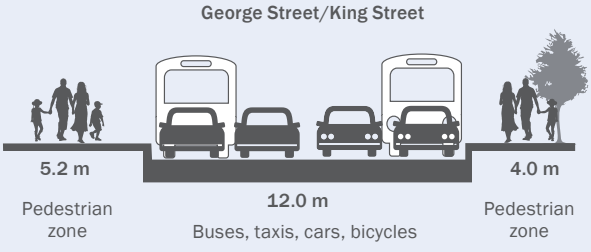
Combined with other initiatives, such as revitalising laneways and encouraging more residential development in the city centre, it has helped to transform Melbourne into one of the world's most liveable cities.

### Sydney

Parts of inner Sydney have higher population densities than inner areas of European cities like Copenhagen and Stockholm.[106] Sydney also has a very high share of walking trips – 93 per cent of all trips within the inner city are walking trips or around 1.2 million trips a day.[107] Yet, unlike Copenhagen and Stockholm, Sydney is not known as a pedestrian-friendly city. Inner Sydney streets have most of their space dedicated to the 7 per cent of trips that are made by motorised vehicles.



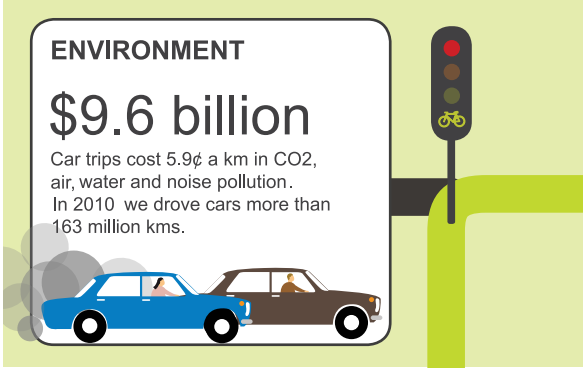

Sydney's streets are generally narrow, with widths of about 20 metres overall. George Street is one of the busiest streets for pedestrians in the Sydney CBD, yet the footpath is only four or five metres wide in many places, with 12 metres dedicated to motorised traffic.




There are few laneways to provide service routes or alternative connections for pedestrians. The busy streets service high-density employment, retail and residential buildings. Most streets attempt to serve the same function by maximising space for vehicles and limiting space for pedestrians. The result is that all road users have constrained mobility.

106 Gehl Architects 2007, *Public Spaces Public Life, Sydney.*
107 Transport for NSW 2012, *NSW Long Term Transport Master Plan – discussion paper,* p37.

# 3.4 Environment




In the December quarter of 2011, transport was the second-largest emitter of greenhouse gas emissions after electricity generation and other fixed sources.[108] Transport accounted for 88.6 million tonnes of carbon dioxide equivalent or about 16 per cent of total emissions, with cars contributing around half of this.[109]

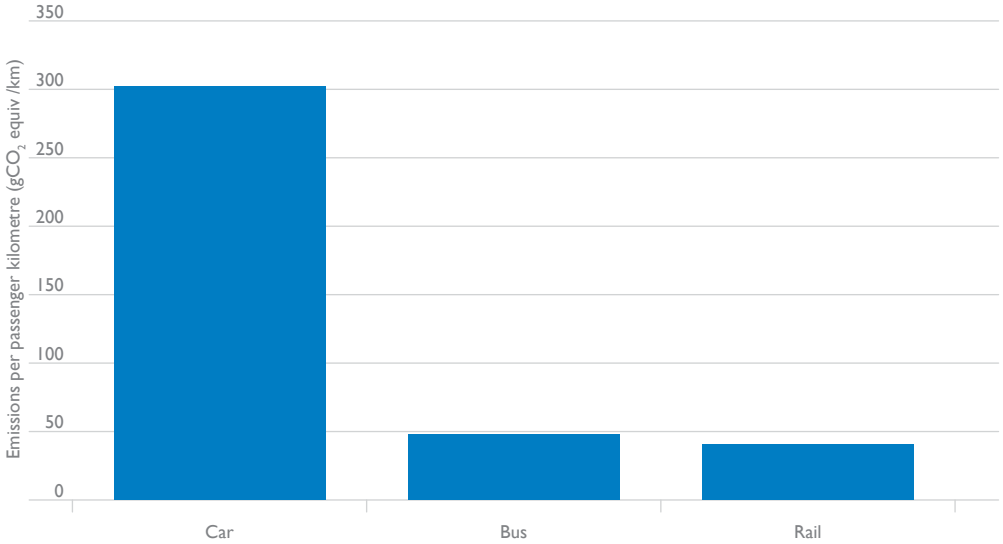
Motor vehicles are a major source of common air pollutants, including hydrocarbons (HC), volatile organic compounds (VOCs), and oxides of nitrogen (NOx). In Sydney, for example, motor vehicle exhaust emissions contribute over 71 per cent of NOx and over 38 per cent of VOCs, excluding emissions associated with refuelling. NOx and VOCS are major contributors to smog.[110]

According to the Victorian Integrated Survey of Travel and Activity 2007, 3.69 million trips under five kilometres were made by car on an average weekday in metropolitan Melbourne.[111] Travel behaviour studies across Australia have shown significant reductions in household emissions from reducing the amount of short trips made by car (see Appendix C – State and Territory walking and bicycle plans).

Figure 3.6 shows the greenhouse gas emissions from different forms of passenger transport in Australian cities during peak travel times. Cars carrying an average 1.2 passengers emit 302 grams of carbon dioxide ($CO_2$) equivalent per passenger kilometre compared with bus (48 grams) and rail (40.7 grams).[112] Walking and riding are considered to emit negligible greenhouse gases: whilst some argue that walkers and riders exhale greater amounts of carbon dioxide and therefore burn more calories than users of other modes of transport, this is not generally included in economic benefit–cost calculations.[113]

108 Department of Climate Change and Energy Efficiency 2011, *National greenhouse gas inventory*, December 2011, www.climatechange.gov.au/en/publications/greenhouse-acctg/national-greenhouse-gas-inventory-2011-12.aspx. Accessed 17 September 2012.
109 BITRE 2012, *Infrastructure Yearbook, tables T9.4 and T9.5.*
110 Department of the Environment and Heritage 2009, *Second national in-service emissions study (NISE2) Light duty petrol vehicle emissions testing* www.environment.gov.au/atmosphere/transport/nise2.html. Accessed 17 September 2012.
111 Victorian Government Department of Transport 2009, *Victorian Integrated Survey of Travel and Activity 2007.*
112 BITRE 2010, *Long-term Projections of Australian Transport Emissions: Base Case 2010 – report for the Department of Climate Change and Energy Efficiency*, www.climatechange.gov.au/publications/projections/~/media/publications/projections/bitre-transport-modelling-pdf.pdf. Accessed 17 September 2012.
113 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC.

Figure 3.6 Greenhouse gas emissions per passenger kilometre during peak travel times in Australian cities (grams of $CO_2$ equivalent)



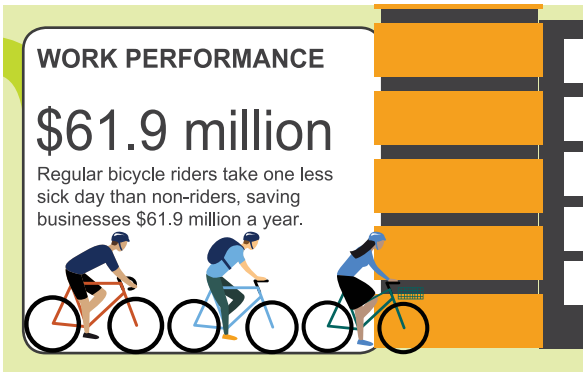

Source: BITRE 2010, Long-term Projections of Australian Transport Emissions: Base Case 2010. Assumptions: Car – average peak period occupancy 1.2 with allowance for congestion; Bus – peak average bus occupancy at about 20 per cent; Rail – peak load factors average 80 per cent.

In the cost–benefit analysis discussed in the beginning of section 3.1, the combined environmental benefits of reducing noise and greenhouse gas emissions, and improving air quality, add to around 5.9 cents per kilometre. This represents approximately 3 per cent of the benefits of a generic walking-related infrastructure project and 3 per cent of the benefits of a generic cycling-related infrastructure project.[114]

| Benefit | Value (per km) | Lower bound | Upper bound |
|---|---|---|---|
| Noise reduction | 0.9 cents | 0.7 cents | 1.2 cents |
| Air quality | 2.8 cents | 2.8 cents | 2.9 cents |
| Greenhouse gas emissions | 2.2 cents | 2.0 cents | 2.5 cents |
| **Total environmental benefits** | **5.9 cents / km** | | |

114 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects*, prepared by SKM and PWC, table EX.1: benefits summary.

## 3.5 Community




Walking and bicycle riding provide benefits to community wellbeing, social capital and community engagement. Well-considered land use patterns (such as mixed use development locating housing near commercial, educational and retail amenities), quality urban design, integration with public transport, appropriate road speeds, good lighting and signage and improved pedestrian and bicycle paths are all methods for encouraging greater community participation and improving liveability. The Cycling England strategy found that:

> *There is a broad consensus that cycling offers tangible benefits for those who participate, but also for society as a whole … Cycling plays a role in providing more independence to children; improving the quality of life for communities and … supporting tourism.*[115]

The greatest growth in walking and riding can be achieved by people incorporating these modes as part of their daily routine, including children, the elderly and women who are currently under-represented in bicycling in Australia. In planning for bicycling and pedestrian infrastructure, it is important to consider its appeal and uptake within the broader community: 'The provision of walkable neighbourhoods, with frequent accessible public transport is an important strategy to limit "transport poverty" (for example households without access to public transport). It also prevents marginalisation of other vulnerable subgroups with restricted mobility (for example children, older people and people with disabilities).'[116]

Walking and riding have been shown to have a positive impact on work performance. Regular bicycle riders take, on average, 1.3 fewer sick days than non-riders.[117]

## 3.6 Individuals and households

Walking and riding a bicycle are affordable and available to most people and provide a convenient form of transport for short trips. Operating costs are substantially lower for riding than for driving, and they are zero for walking. In the benefit–cost analysis discussed at the beginning of this chapter, the vehicle operating cost savings benefit was calculated at around 35 cents per kilometre for a generic walking and riding infrastructure project.[118]

| Benefit | Value (per km) |
|---|---|
| **Vehicle operating costs** | **35 cents / km** |

115 Cycling England 2007, *Bike for the Future II: a funding strategy for National Investment in Cycling in 2012,* p66.
116 Giles-Corti B, Foster S, Shilton T & Falconer R 2010, 'The co-benefits for health of investing in active transportation', *NSW Public Health Bulletin*, 21(5–6) p123.
117 London School of Economics 2011, *The British Cycling Economy,* citing Hendriksen et al 2010, 'The association between commuter cycling and sickness absence', Preventative Medicine, 51 pp132–135.
118 Queensland Department of Transport and Main Roads 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC.

# 3.7 Summary of cost–benefit analyses

The multiple benefits gained from increasing walking and riding are encouraging. However, in assessing any given project it is important to weigh these benefits against the costs.

The following section addresses the issue of capital costs for construction of infrastructure, and provides a summary of cost–benefit analyses both in Australia and internationally.

It is important to note that both Australian and international experiences have consistently demonstrated that the most successful outcomes have been achieved when a range of interventions, in addition to infrastructure, are implemented. Such additional interventions include long-term land use and network planning as well as education, social marketing and travel behaviour change programs. Case studies presented in this paper include Australia, the United States and England.

## Capital costs of construction

The costs of construction for projects vary widely depending on the type and extent of infrastructure works, the complexity of planning and design and whether any purchase of land is required.

Basic constructions costs for a simple 3.0 metre wide bicycle or walking path without bridges, land purchases, planning or other costs range from $46 000 per kilometre for a basic asphalt path designed for low traffic to $300 000 per kilometre for a reinforced concrete path designed for medium traffic.[119] Overall costs are around $1.5 million per kilometre for an off-road bikeway path (to Austroads standards) or $300 000 per kilometre for an on-road bicycle lane.[120]

Depending on the specific circumstances, overall costs may be considerably higher. Recently published evaluations in Australia show total costs for inner city projects ranging from $1.5 million per kilometre (Go-Between Bridge, Brisbane),[121] $1.875 million per kilometre (3.2-kilometre Civic Cycle Loop, Canberra)[122] and $3.26 million per kilometre (54-kilometre Inner Sydney Bicycle Network)[123] up to as high as $25.9 million per kilometre for a highly complex route through North Sydney to the Sydney Harbour Bridge (three-kilometre Harbour Bridge link, Sydney).[124]

A recent analysis of a range of projects in South East Queensland (Figure 3.7) shows the construction costs for a range of different transport projects where a separated bicycle path, or bikeway, was included as part of the project works (refer to case study on favourable funding in Queensland, section 6.2.2).

119 Queensland DTMR 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PwC.
120 Queensland DTMR 2011, unpublished data.
121 Queensland DTMR 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PwC.
122 www.canberratimes.com.au/act-news/work-starts-on-6m-cycle-loop-around-civic-20120711-21wn7.html. Accessed 19 September 2012.
123 City of Sydney 2011, *Inner Sydney Regional Bicycle Network: demand assessment and economic appraisal,* prepared by AECOM.
124 North Sydney Council 2010, *Evaluation of the costs and benefits to the community of financial investment in the Naremburn to Harbour Bridge Active Transport Corridor,* prepared by PwC.

Figure 3.7 South East Queensland transport projects with bikeway included (2008–2010)

| Project type | Length (km) | Cost ($m) | Cost per km ($m) | Bikeway cost as % of total project cost | Bikeway cost ($m) |
|---|---|---|---|---|---|
| Busway project | 2 | 366 | 183.0 | 3.3% | 12.00 |
| Busway project | 1.05 | 300 | 285.7 | 0.3% | 1.58 |
| Busway project | 1.2 | 195.5 | 162.9 | 0.9% | 1.80 |
| Busway project | 3 | 581.5 | 193.8 | 3.1% | 18.00 |
| **Average busway project** | | | **$206.4m** | **1.95%** | |
| Rail project | 2.5 | 46 | 18.4 | 8.2% | 3.75 |
| Rail project | 15.9 | 70 | 4.4 | 34.1% | 23.85 |
| Rail project | 11 | 277 | 25.2 | 6.0% | 16.50 |
| Rail project | 14 | 300 | 21.4 | 7.0% | 21.00 |
| Rail project | 5 | 218 | 43.6 | 3.4% | 7.50 |
| Rail project | 4.5 | 189 | 42.0 | 3.6% | 6.75 |
| Rail project | 2.5 | 85 | 34.0 | 4.4% | 3.75 |
| Rail project | 10 | 385 | 38.5 | 10.4% | 40.00 |
| **Average rail project** | | | **$28.4m** | **9.62%** | |
| Motorway / Road project | 2 | 20 | 10.0 | 3.0% | 0.60 |
| Motorway / Road project | 7.5 | 543 | 72.4 | 2.1% | 11.25 |
| Motorway / Road project | 2.2 | 255 | 115.9 | 1.3% | 3.30 |
| Motorway / Road project | 18 | 366 | 20.3 | 7.4% | 27.00 |
| Motorway / Road project | 24 | 1,880 | 78.3 | 1.9% | 36.00 |
| Motorway / Road project | 0.5 | 370 | 740.0 | 5% | 18.5 |
| Motorway / Road project | 2.7 | 315 | 116.7 | 7.0% | 22.00 |
| **Average motorway/road** | | | **$164.8m** | **3.95%** | |
| Road tunnel project | 6.8 | 2,090 | 307.4 | 0.5% | 10.20 |
| Road tunnel project | 5.7 | 4,800 | 842.1 | 0.2% | 8.55 |
| Road tunnel project | 5.5 | 1,700 | 309.1 | 0.5% | 8.25 |
| **Average road tunnel** | | | **$486.2m** | **0.38%** | |
| **Light rail project** | **13** | **949** | **$73.0m** | **2.1%** | **19.50** |
| **Underground rail project** | **10** | **8,000** | **$800.0m** | **0.2%** | **15.00** |

Source: Queensland DTMR 2011, unpublished data.

Walking and riding infrastructure is relatively inexpensive to construct when compared with other modes of transport. At an average $1.5 million per kilometre to plan and construct a bikeway:[125]

- one kilometre of light rail costs the equivalent of 49 kilometres of bikeway
- one kilometre of motorway/road costs the equivalent of 110 kilometres of bikeway
- one kilometre of busway costs the equivalent of 138 kilometres of bikeway
- one kilometre of road tunnel costs the equivalent of 324 kilometres of bikeway
- one kilometre of underground rail costs the equivalent of 533 kilometres of bikeway.

*Taken in Canberra in 2012 and recreating a photograph taken in Germany over 20 years ago, this image shows the typical road space required by three modes of transport – bus, bicycle and car – to transport 69 people. Courtesy Cycling Promotion Fund.*

Maintenance costs are also significantly less than for other transport project types, ranging from 0.04 cents per bicycle kilometre for concrete paths to 1.82 cents per bicycle kilometre for basic asphalt paths.[126]

| Mode | Average operating cost per passenger kilometre |
|---|---|
| Bicycle – concrete path | 0.05 cents per km |
| Bicycle – asphalt path | 0.052 cents per km |
| Bus | 22.1 – 76.0 cents per km |
| Train | 0.93 – 41 cents per km |
| Car | 0.194 cents per km |

Source: Queensland DTMR 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PwC, table 5.2.

125 Queensland DTMR 2011, unpublished data.
126 Queensland DTMR 2011, *Benefits of inclusion of active transport in infrastructure projects,* prepared by SKM and PWC.

## Summary of benefit–cost ratios

The following table (Figure 3.8) summarises the benefit–cost ratios of a range of projects across Australia from evaluations carried out between 2006 and 2011. Benefit–cost ratios ranged from 0.6:1 to 4.5:1 depending on the location. Variations were due to a range of factors including different locations (affecting construction costs as well as anticipated demand) and differing methodologies for evaluation.

### Figure 3.8 Evaluations of investments in walking and riding, Australia, 2006–2011

| Location | Program | Length of infrastructure (km) | Cost per km ($m) | Benefit-cost ratio | Source |
|---|---|---|---|---|---|
| **Policy** | | | | | |
| South East Queensland | Active Travel Policy for South East Queensland | na | 482.0 | 2.0 | 1 |
| **Program** | | | | | |
| Perth, WA | TravelSmart Workplace program 2005–2011 | na | 7.0 | 4.5 | 2 |
| Perth, WA | TravelSmart Local Government program 2001–2011 | na | 12.0 | 2.54 | 2 |
| **Project – network** | | | | | |
| Sydney, NSW | Nine cycling projects within inner city Sydney | | 102.0 | 1.3 | 3 |
| Sydney, NSW | Inner Sydney Regional Bicycle Network | 54 | 175.8 | 3.88 | 4 |
| Perth, WA | Perth Bicycle Network | | 75.6 | 3.3 | 5 |
| **Project – single** | | | | | |
| Sydney, NSW | Harbour Bridge link | 3 | 55.8 | 2.34 | 6 |
| Brisbane, QLD | North Brisbane Cycleway | | 30.5 | 2.4 | 7 |
| Brisbane, QLD | Houghton Hwy – Ted Smout Bridge | | 18.0 | 1.3 | 7 |
| Brisbane, QLD | Go-Between Bridge | | 13.8 | 1.0 | 7 |
| Brisbane, QLD | Moreton Bay Rail Link path | 12.6 | 50.0 | 0.6 | 7 |

Sources: (1) Marsden Jacob Associates 2009, *Economic Feasibility Assessment of the Active Transport Policy,* for DTMR. (2) Marsden Jacob Associates 2011, *Evaluation of the TravelSmart Local Government and Workplace Program,* for Department of Transport WA. (3) PwC 2009, *Evaluation of the costs and benefits to the community of financial investment in cycling programs and projects in NSW*, for RTA and Department of Environment and Climate Change. (4) AECOM 2010, *Inner Sydney Regional Bicycle Network: demand assessment and economic appraisal,* for City of Sydney. (5) Austroads 2006, *Guide to Project Evaluation – Part 8: Examples,* section 3.10 citing Ker 2004. (6) PwC 2010, *Evaluation of the costs and benefits to the community of financial investment in the Naremburn to Harbour Bridge Active Transport Corridor,* for North Sydney Council. (7) PwC and SKM 2011, *Benefits of inclusion of active transport in infrastructure projects*, for DTMR.

Figure 3.9 summarises benefit–cost ratios of international programs from the United Kingdom, United States and Norway. Some of these are infrastructure-only projects whilst others are comprehensive city, state or federal programs. Benefit–cost ratios range from 2.94:1 to 37.6:1.

### Figure 3.9 Evaluations of investments in walking and riding – international data

| Location | Type | Benefit-cost ratio |
|---|---|---|
| | **Evaluation after program completed** | |
| **United Kingdom** | Walking and cycling schemes | 18.4–37.6 |
| | Links to schools – three schemes for walking and cycling (Bootle, Hartlepool, Newhaven) | 14.9–32.5 |
| | Sustainable travel towns | 4.5* |
| | Walking and cycling trails | 2.94 |
| | **Evaluation before program completed** | |
| **United States** | Increasing walking and cycling in US | 20 |
| | Comprehensive bicycle network (3 scenarios) for Portland, Oregon | 1.0–3.8 |
| | Sidewalk provision in Dane County, Winsconsin | 1.87 |
| | Five walking and cycling trails in Lincoln, Nebraska | 2.94 |
| **Norway** | Urban walking and cycling network completion in Norwegian towns | 2.9–14.3 |

Source: Sinnett, Williams, Chatterjee & Cavill 2011, *Making the Case for Investment in the Walking Environment: a review of the evidence*, University of the West of England and Cavill Associates, pp40–42. Portland, Oregon figures from Gotschi 2011, 'Costs and Benefits of Bicycling Investments in Portland, Oregon', *Journal of Physical Activity and Health,* 8(Suppl 1), S49–S58.

This chapter has shown that there are many benefits to increasing participation in walking and riding. The majority of the economic benefits are gained in the area of health, with additional benefits to traffic decongestion, environment and community. Depending on the overall costs and anticipated demand, benefits can be significantly higher than costs for many active travel programs.

CHAPTER 4

# Current policy framework setting

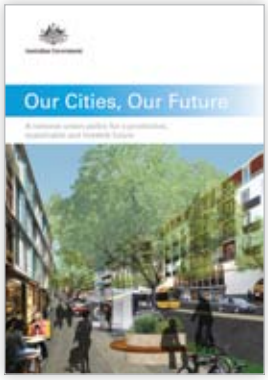
## 4.1 Related national policies

A number of objectives and targets have already been established by national policies and strategies that are of relevance to the active travel agenda, including the National Urban Policy, National Road Safety Strategy, National Cycling Strategy, National Partnership on Preventive Health, National Disability Strategy and Clean Energy Future.

Other national policies include *Sustainable Australia – Sustainable Communities: a sustainable population strategy for Australia* and the COAG Standing Council on Environment and Water's proposed *National Plan for Clean Air*, which will respond to the review of National Environment Protection (Ambient Air Quality) Measure and provide a framework to reduce air pollution.

All three levels of government have an impact on, or are affected by, policies and programs related to active travel. The following section considers the current policy frameworks across the three levels of government and explores the role of businesses and the community.

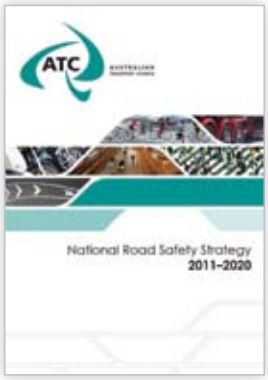
### National Urban Policy




The National Urban Policy *Our Cities, Our Future* (2011) articulates the Australian Government's vision and objectives for cities. One of its key objectives is to improve transport options and reduce our dependence on private motor vehicles. A further objective is to improve public health outcomes through better built environments.

Implementation of the National Urban Policy is overseen by the Commonwealth Group on Cities, made up of relevant Commonwealth portfolios. Input on implementation is also provided by the recently established Urban Policy Forum, which represents a range of peak industry, professional and community organisations as well as local government. These two groups are chaired by the Department of Infrastructure and Transport.

## National Road Safety Strategy




Each year, road crashes around the nation cause around 1400 deaths and 32 500 serious injuries and cost the economy around $27 billion.[127]

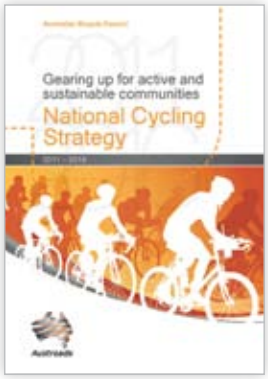
The *National Road Safety Strategy 2011–2020* was signed by Commonwealth, state and territory ministers responsible for roads.

It is premised on a long-term 'vision zero' – that no person should be killed or seriously injured on Australia's roads. It has set an interim target to reduce road deaths and serious injuries by at least 30 per cent by 2020. This compares with a 23 per cent reduction in road deaths achieved over the previous decade.[128]

The National Road Safety Strategy adopts the Safe System approach and incorporates four main elements: safe roads, safe speeds, safe vehicles and safe people.

The Safe System approach is based on the idea that serious injury and death on the road network can, and should, be prevented. It 'takes a holistic view of the road transport system and the interactions of its various elements. It aspires to create a road transport system in which human mistakes do not result in death or serious injury'.[129] It was first adopted in Sweden's Vision Zero and the Netherlands' *Sustainable Safety Strategy*[130] and was later adopted into Australia's *National Road Safety Strategy 2001–2010.*

## National Cycling Strategy




The Department of Infrastructure and Transport provides funding to a joint Commonwealth and state body, Austroads, to operate the Secretariat for the Australian Bicycle Council. A representative of the Department participates in the Council's regular meetings along with each of the states and territories, a representative of the Australian Local Government Association, the bicycle industry, bicycle user groups and representatives from the Commonwealth Health and Environment portfolios.

In 2010 the Australian Bicycle Council issued its third five-year strategy, *National Cycling Strategy 2011–2016*, which sets a target of doubling the number of people regularly riding bicycles over the five-year term (see Appendix A). Ten thousand households were surveyed across the nation to establish the 2011 benchmark.

The *National Cycling Strategy 2011–2016* is signed by Commonwealth, state and territory ministers responsible for roads and transport agreeing to:

- promote cycling as a viable and safe mode of transport and an enjoyable recreational activity
- create a comprehensive and continuous network of safe and attractive routes to cycle and end-of-trip facilities
- consider and address cycling needs in all relevant transport and land use planning activities
- enable people to cycle safely
- improve monitoring and evaluation of cycling programs and develop a national decision-making process for investment in cycling
- support the development of nationally consistent guidance for stakeholders to use and share best practice across jurisdictions.

127 Australian Government 2011, *National Road Safety Strategy 2011–2020.*
128 *Ibid.*
129 *Ibid.*
130 Australasian College of Road Safety, http://acrs.org.au/wp-content/uploads/ACRSSafe-Systems.pdf. Accessed 17 September 2012.

The Australian Bicycle Council regularly commissions specific research and guidance on a variety of relevant topics ranging from economic value of active transport to rider safety and the provision of suitable facilities. The Australian Bicycle Council Secretariat maintains the Cycling Resource Centre website (www.cyclingresourcecentre.org.au), which is updated regularly with Australian and international literature related to cycling.

## National Partnership Agreement on Preventive Health


NATIONAL PARTNERSHIP AGREEMENT ON PREVENTIVE HEALTH

The national preventative health agenda is aimed at three major lifestyle risk factors for chronic disease: obesity, alcohol and tobacco. The National Partnership Agreement on Preventive Health[131] commits parties to address the rising prevalence of lifestyle related chronic diseases by implementing programs and activities that promote healthy behaviours in the daily lives of Australians, with support from social marketing messages and evidence-building infrastructure. The Australian Government will provide $872.1 million over nine years from 2009–10. This is the largest investment ever made by an Australian Government in health prevention.

In January 2011 the Australian National Preventive Health Agency[132] (www.anpha.gov.au) was established as part of the National Partnership Agreement.

The National Partnership Agreement established obesity-related targets including a 15 per cent increase in the proportion of children and adults meeting national guidelines for physical activity by 2018; and for the proportion of children and adults at a healthy weight to return to baseline level by 2018.

Through the National Partnership Agreement on Preventive Health the Australian Government is providing $71.8 million over five years from 2009–10 under the Healthy Communities Initiative to support local governments to deliver community-based physical activity and healthy eating programs and to develop a range of local policies that support healthy lifestyle behaviours.

The Healthy Communities initiative also provides National Program Grants to six not-for-profit organisations to expand healthy lifestyle programs across Australia. Two of these programs – AustCycle (Cycling Australia) and Heart Foundation Walking (National Heart Foundation of Australia) – promote cycling and walking respectively. A small allocation has also been made to travel behaviour change programs through the states and territories (refer to Appendix D – TravelSmart programs).

131 Department of Health and Ageing 2008, *National Partnership Agreement on Preventive Health*, Australian Government, Canberra, available from www.health.gov.au/internet/main/publishing.nsf/Content/phd-prevention-np. Accessed 17 September 2012.

132 Australian National Preventative Health Agency (ANPHA) 2012, www.anpha.gov.au

*Taking Preventative Action – a response to Australia: the healthiest country by 2020 – the report of the national preventative health taskforce*[133] was issued in 2010. It was the Australian Government's response to the *National Preventative Health Strategy – Australia: the healthiest country by 2020*,[134] which included a number of action areas related to physical activity and obesity:

**Key action area 1:** Drive environmental changes throughout the community that increase levels of physical activity and reduce sedentary behaviour

**Key action area 3:** Embed physical activity and healthy eating in everyday life

**Key action area 4:** Encourage people to improve their levels of physical activity and healthy eating through comprehensive and effective social marketing

**Key action area 8:** Support low-income communities to improve their levels of physical activity and healthy eating.

The *National Preventative Health Strategy* acknowledged that solutions to address obesity are likely to impact on a large proportion of the population and are fundamental to improving the health of Australians:

> *It is well documented that public policies across a range of government portfolios impact on obesity levels and health more broadly. Health is an outcome of a wide range of factors – such as changes to the natural and built environments, and to social and work environments – many of which lie outside the activities of the health sector and require a shared responsibility and an integrated and sustained policy response across government.*
>
> *Accordingly, government policies can have positive or negative impacts on the determinants of health. Such impacts are reflected in the health status of the population today, and in the health prospects of future generations.*[135]

It recommended identifying key impediments and enablers of physical activity in relation to the built environment, transport and social engagement, including:

- the built environment – relevant Australian and state government legislation, including building codes and planning guidelines
- transport – relevant transport policy and guidelines, including examples of good practice such as TravelSmart and the National Cycling Strategy
- economic barriers and enablers – policies, tax incentives and financial subsidies.

133 Department of Health and Ageing 2010, *Taking Preventative Action,* Australian Government, Canberra, available from www.yourhealth.gov.au/internet/yourhealth/publishing.nsf/Content/report-preventativehealthcare. Accessed 17 September 2012.

134 National Preventative Health Taskforce 2009, *National Preventative Health Strategy – Australia: the healthiest country by 2020*, available from www.preventativehealth.org.au/internet/preventativehealth/publishing.nsf/Content/national-preventative-health-strategy-1lp. Accessed 17 September 2012.

135 National Preventative Health Taskforce 2009, *National Preventative Health Strategy – Australia: the healthiest country by 2020.*

## National Disability Strategy 2010–2020


The *National Disability Strategy 2010–2020* is signed by all state and territory governments, the Australian Local Government Association and the Australian Government. It includes an outcome for inclusive and accessible communities: to ensure that people with disability live in accessible and well-designed communities with opportunity for full inclusion in social, economic, sporting and cultural life.

It includes a policy direction for public, private and community transport systems that are accessible for the whole community. It states that:

> *The ability to move around the community underpins all aspects of life for people with disability … People with disability are often still unable to make use of footpaths, cycle paths and local roads as many of these have not been designed to be fully accessible. A continuous accessible path of travel for people with disability needs to connect public transport nodes with local services and accessible housing.*[136]

## Clean Energy Future


Australia has agreed to reduce its carbon emissions to 5 per cent below year 2000 levels by 2020 and to 80 per cent below year 2000 levels by 2050. It has also introduced a price on carbon pollution from 1 July 2012. In relation to the transport sector, the carbon price applies only to fuels used in domestic aviation, marine and rail transport.

## Standing Council on Transport and Infrastructure

The Department of Infrastructure and Transport chairs and provides the Secretariat for the Transport and Infrastructure Senior Officials Committee (TISOC) and Standing Council on Transport and Infrastructure (SCOTI), which reports to the Council of Australian Governments (COAG).

Both the National Transport Commission and Austroads report to SCOTI. The Department of Infrastructure and Transport issues and reports on the National Road Safety Strategy. The Australian Bicycle Council reports on the progress of the National Cycling Strategy.

136 Council of Australian Governments 2011, *National Disability Strategy 2010–2020*, p32.

## 4.2 Commonwealth portfolios

Long-term benefits of increased walking, bicycle riding and public transport mode share are of importance to many Commonwealth portfolios, as illustrated in Figure 4.1.

Figure 4.1 Portfolios that benefit from increases in walking, riding and public transport mode share

| Commonwealth portfolios | Benefits |
|---|---|
| Health and Ageing | ▼ Health care costs through healthier population |
| Sustainability, Environment, Water, Population and Communities | ▼ Resource use and air pollution<br>▲ Community wellbeing |
| Climate Change and Energy Efficiency | ▼ Greenhouse gas emissions |
| Infrastructure and Transport | ▲ Capacity and safety in the transport network |
| Regional Australia, Local Government, Arts and Sport | ▲ Support for regional and local communities<br>▲ Sport and recreation facilities |
| Families, Housing, Community Services and Indigenous Affairs | ▲ Community wellbeing and social cohesion<br>▲ Access to opportunities |
| Resources, Energy and Tourism | ▼ Resource and energy use<br>▲ Tourism and visitor experience and opportunities |
| Finance and Treasury | ▼ Long-term spending, particularly for health portfolio |
| Education | ▲ Access to schools and tertiary education |
| Defence | ▲ Access to defence accommodation and work sites |

The Health, Environment and Climate Change portfolios are strong supporters of 'active' modes of travel because of public health, environment and community benefits.

Previous support has included funding to states and territories for TravelSmart behaviour change programs (see Appendix D – TravelSmart programs) and for the development of Healthy Spaces and Places design guidelines to encourage the design of better built environments which support physical activity (see section 4.5).

## 4.2.1 Funding

### Infrastructure funding

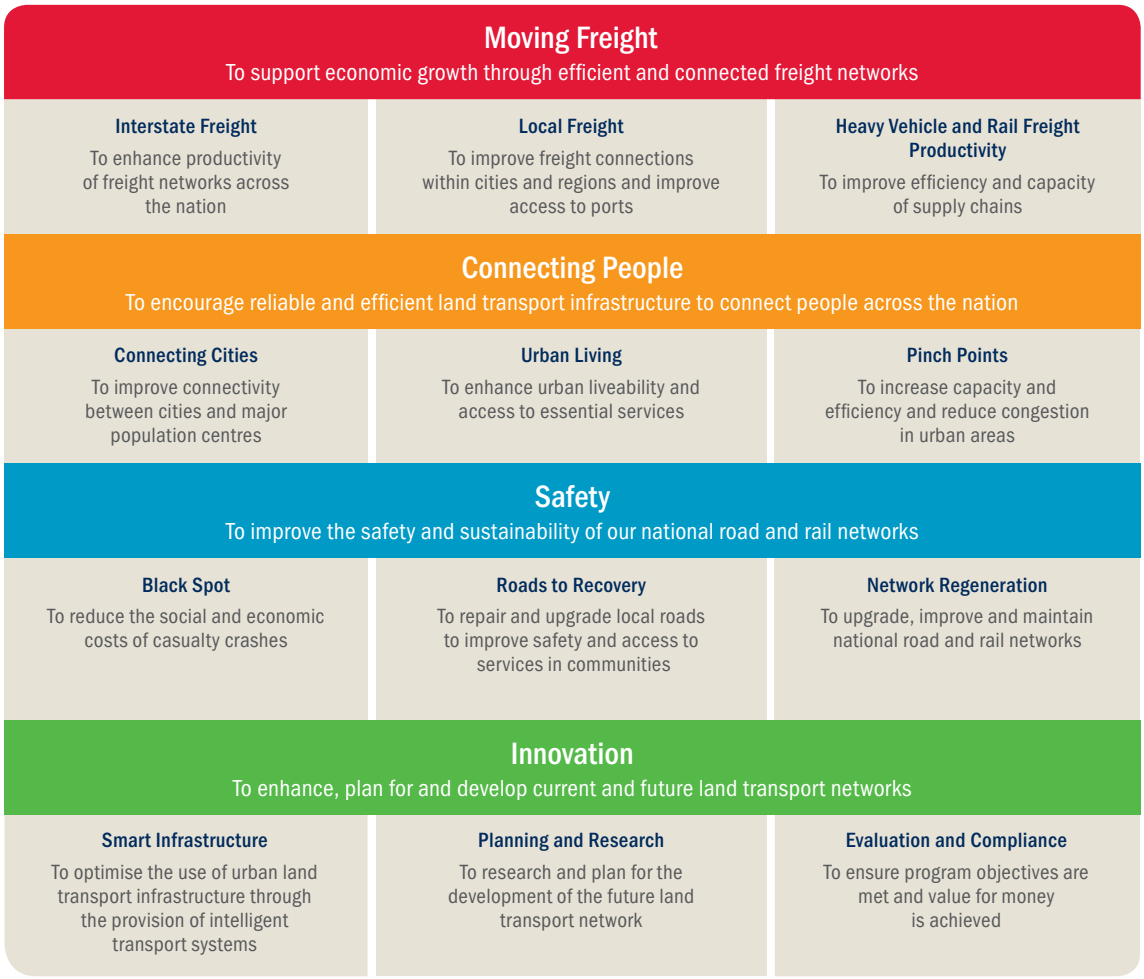
The Australian Government administers programs that fund transport infrastructure across Australia.

While recognising that the primary responsibility for the provision of pedestrian and bicycle facilities rests with state, territory and local governments, the current Nation Building Program indirectly provides cycling infrastructure through the funding of projects.

The current Nation Building Program, which runs from 2008–09 through to 2013–14, will deliver approximately $36 billion of land transport infrastructure, ranging from major road and rail construction projects through to many smaller-scale local road projects. A number of road and rail projects funded under the Nation Building Program and delivered by state, territory and local governments incorporate bicycle facilities. A description of the pedestrian and bicycle infrastructure components is provided in Appendix B – Recent national infrastructure projects that incorporate walking and riding.

The broad framework for the Nation Building 2 (NB2) Program, which will run from 2014–15 to 2018–19, was announced with the 2012–13 Budget. The overarching objective of NB2 will be to 'lift Australia's productivity through nationally significant land transport infrastructure', supported by four cornerstone themes. Each theme will consist of three subcomponents, as represented in the diagram below. Details for each subcomponent are still being developed by the Australian Government.

Figure 4.2 Framework for the Nation Building 2 Program




Source: Australian Government 2012, *Nation Building: Driving Australia's Productivity.*

## Case study: Liveable Cities Program

Announced as part of the 2011–12 Budget, the $20 million Liveable Cities program was designed to support a range of demonstration and planning projects to align with the objectives of the National Urban Policy and COAG capital cities reform agenda.

The program sought to promote high-quality urban design, improve the quality of open space and public places, address high levels of car dependency and traffic congestion and support cities in tackling the challenges of climate change.

At least four of the selected demonstration projects will help to deliver better pedestrian or riding networks around key employment and activity centres. The $6.25 million of Commonwealth funding for these four projects will leverage nearly $24 million of co-contributions from state and local governments, totalling more than $30 million investment in pedestrian and cycling-related infrastructure. Three of these projects are described below.

### Parramatta River City Renewal – Western Sydney, NSW

This $16 million project will complete three critical missing links along the northern Parramatta River foreshore. It will provide a continuous east–west separated cycling and walking link between the University of Western Sydney, current and future riverside medium-density housing developments and key employment destinations in the Parramatta city centre.

The Australian Government committed $3.75 million to the Parramatta River City Renewal project through the Liveable Cities program. The Parramatta River Urban Design Strategy was recently awarded a prestigious Australia Award for Urban Design.[137]

### Vibrant Adelaide: Energising the City – Adelaide, SA

The Vibrant Adelaide project implements the state's 30-Year Plan for Greater Adelaide and 5000+ project to develop a more compact urban form with significantly greater levels of infill development for the inner city. It aims to provide better pedestrian and cycling connections between the CBD, River Torrens and Adelaide Oval; convert existing laneways into pedestrian-only or shared pathways; and leverage the private sector in revitalising the CBD.

Just as Melbourne improved its CBD through the revitalisation of its underused laneways, this project will significantly improve pedestrian links to leverage current investments underway, as well as public transport to and from the city. It is a key project in implementing the vision for Adelaide as a compact, vibrant and creative city and has strong community support.

The Australian Government committed $1 million through the Liveable Cities program, with additional co-contributions of over $10 million.

### Improving Albury Wodonga's Cycling Infrastructure – Albury, NSW and Wodonga, VIC

This project will improve the bicycle infrastructure network in the Albury and Wodonga CBDs, including linkages between the two city centres and railway precincts. It is anticipated that the twin cities will experience an increase in the number of residents opting to cycle to work and study, decreasing the demand on road and transport infrastructure into the future.

The project would complement existing infrastructure and community facilities such as the London-style way-finding maps for pedestrians and bicycles in Wodonga's CBD and the off-road bike paths through parks in both cities.

The Australian Government committed $300 000 through the Liveable Cities program, with an equal $300 000 co-contribution from funding partners.

137 Planning Institute of Australia 2012, 'National Urban Design Award for Parramatta' Media Release, 26 June 2012, available from www.planning.org.au/documents/item/4095. Accessed 17 September 2012.

# 4.3 The role of states and territories

## State and territory policies and programs for active travel

State and territory governments are directly responsible for building and maintaining a significant proportion of Australia's transport systems as well as providing overall metropolitan planning. They have the legal authority to implement planning legislation and nationally agreed codes such as the Building Code of Australia, Australian Road Rules and Austroads road engineering standards and guidelines.

All states and territories have policies or plans that provide for bicycle networks as agreed to in the National Cycling Strategy. Most states and territories also have broader 'active travel' policies and programs in place (Figure 4.2, detailed in *Appendix C – State and Territory walking and bicycle plans*).

Figure 4.2 below summarises some of the principal initiatives undertaken by states and territories which have an impact on walking and riding:

- All states and territories have policies or plans providing for bicycle networks focused around activity centres (see *Appendix C – State and Territory walking and bicycle plans*).
- All states and territories have structured their transport departments to create a clear path for coordinated decision making and portfolio management of the transport network and funding.
- Most states and territories have a 'positive provision' policy to ensure walking and riding infrastructure is delivered as part of the broader transport network.[138]
- All states and territories have previously coordinated TravelSmart behaviour change programs (see *Appendix D – TravelSmart programs*), with some continuing to fund these programs into the future.

138 NSW – RTA Bicycle Policy, 1999; VIC – Bicycle Facilities as part of Road Projects, VicRoads, 2010; QLD – Cycling Infrastructure Policy, Department of Transport and Main Roads, 2011; WA – Policy for Cycling Infrastructure – Main Roads WA, 2000; SA – Safety in Numbers, A Cycling Strategy for SA, 2006–2010; ACT – Urban Services on road cycling policy.

Figure 4.3 State and territory walking and bicycling initiatives

| State | Plan or strategy for bicycle networks around activity centres | Coordinated portfolio management of entire transport network | 'Positive provision' for bicycle / pedestrian paths as part of larger transport projects | Current TravelSmart behaviour change program |
|---|---|---|---|---|
| NSW | ✓ | ✓ | ✓ | |
| VIC | ✓ | ✓ | ✓ | ✓ |
| QLD | ✓ | ✓ | ✓ | ✓ |
| WA | ✓ | ✓ | ✓ | ✓ |
| SA | ✓ | ✓ | ✓ | ✓ |
| TAS | ✓ | ✓ | | |
| NT | ✓ | ✓ | | |
| ACT | ✓ | ✓ | ✓ | |

The cost–benefit analyses of 11 active travel projects in a range of states and territories were summarised in Figure 3.8 above. Costs of projects ranged from $7 million to $482 million. Some were policy based (Active Travel Policy for South East Queensland); some were travel behaviour change programs (TravelSmart in WA); some were scoped to construct a network of paths; and others were single projects. The evaluations showed a range of benefit–cost ratios from 0.6:1 to 4.50:1. Variations were due to a number of factors including construction costs, depending on the complexity and location of the project, and anticipated demand for the infrastructure.

Section 2.1 of this paper reported on walking and riding participation rates across the different states and territories. It is difficult to link participation rates to specific policies and programs. A range of factors is likely to have influenced the outcomes, including street grid patterns, density of development, whether land zoning is mixed-use or single purpose, the extent of off-road bicycle networks, the quality of footpaths, the reach of public transport, and topography, amongst other factors. Section 5.1 analyses some of these differences.

# 4.4 The role of local government

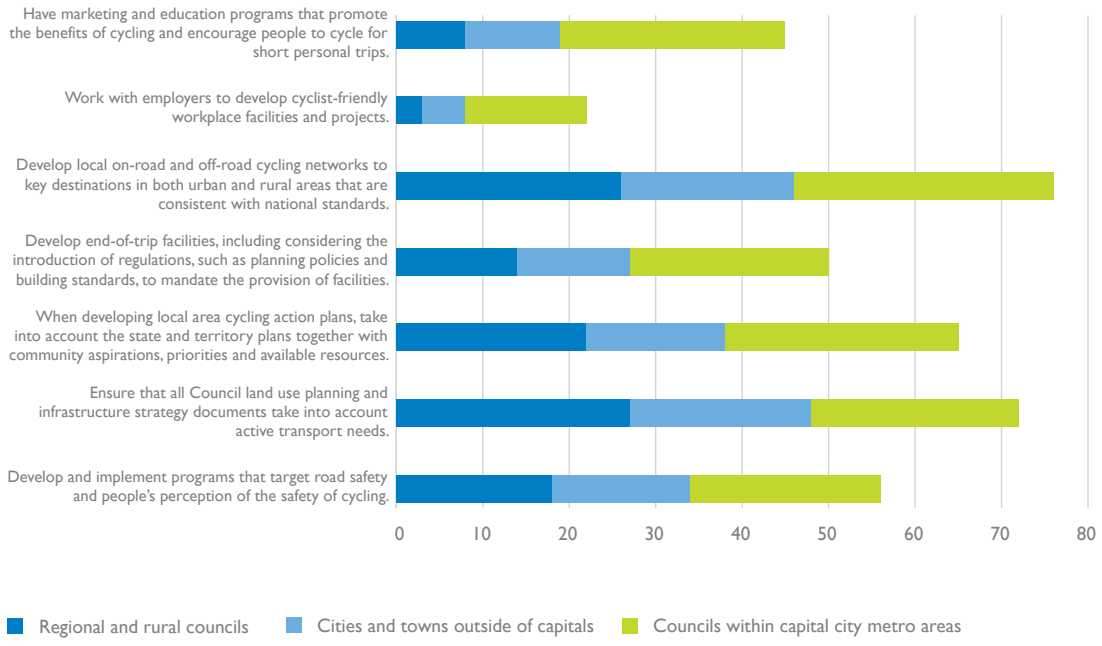
Local governments are largely responsible for building and maintaining local street networks – more than 657 000 kilometres of roadways in total – in addition to off-road walking and cycling routes through parklands and along waterways.

In mid-2011, local governments around Australia participated in a survey commissioned by the Australian Bicycle Council and the Australian Local Government Association, as a follow-up to a similar survey in 2007. Approximately 55 per cent of all local governments in Australia (305 councils) responded to the *Local Government Bicycle Account 2011* survey.

Of the councils that took part, more than two-thirds said they either have a bicycle strategy or are working towards one. The survey investigated the topics covered by council bicycle strategies (96 per cent included infrastructure and 75 per cent included bicycle signage), the start and end dates of their bicycle strategies and the extent to which they integrated with other council strategies and plans.

Survey participants were provided with a list of actions identified in the *National Cycling Strategy 2011–2016* as the responsibility of local government (Figure 4.3). Three-quarters of respondents said they were developing on-road and off-road cycling networks to key destinations and integrating active transport needs into their land use planning and strategies. However, few were working with employers to improve workplace facilities or were developing promotional or educational campaigns to encourage cycling in their local area.

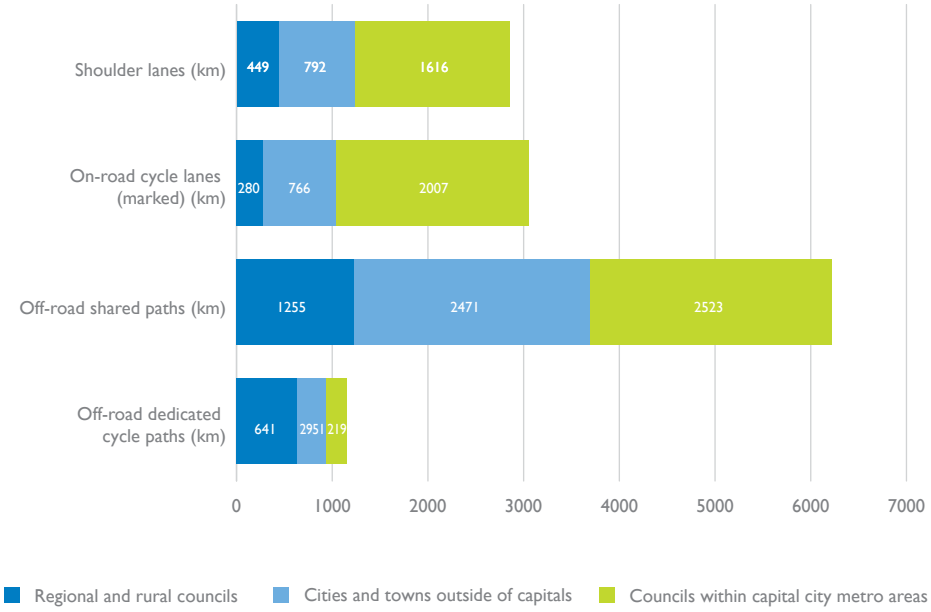
Figure 4.4 Local government links to the National Cycling Strategy outcomes




Source: Australian Bicycle Council 2012, *Local Government Bicycle Account 2011*.

The survey found that 11 704 kilometres of cycling infrastructure had been built by local governments by June 2010. More than half (53 per cent) of the infrastructure was off-road shared paths. Urban-based councils had significantly more cycling infrastructure than non-urban councils.

## Figure 4.5 Length of existing local bicycle network, June 2010

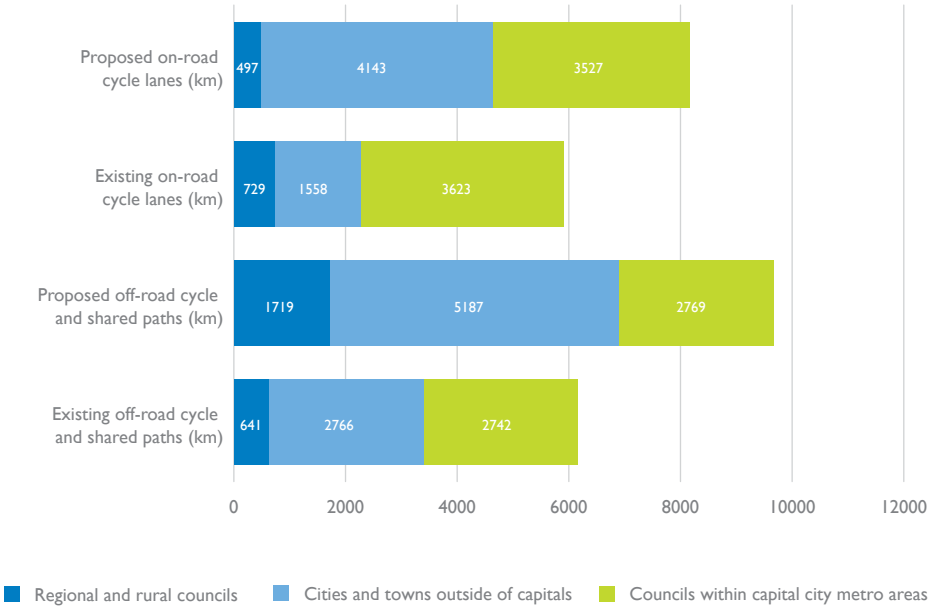



Source: Australian Bicycle Council 2012, *Local Government Bicycle Account 2011.*

Responding councils each had an average of 44 kilometres of on-road and 38 kilometres of off-road infrastructure – a significant increase from 2007, when responding councils had an average of 21 kilometres of on-road and 30 kilometres of off-road infrastructure.

Councils anticipate that, when their planned networks are complete, there will be a total 9675 kilometres of off-road and 8167 kilometres of on-road cycle paths – a total of 17 842 kilometres. This will represent a 52 per cent growth in their networks from 2010 figures.

## Figure 4.6 Proposed local bicycle network when completed




Source: Australian Bicycle Council 2012, *Local Government Bicycle Account 2011.*

The total expenditure on bicycle-related resources by responding councils in the 2009–10 financial year was $72.9 million ($46.6 million in capital cities, $18.4 million in non-capital cities and $7.9 million in rural and regional council areas). The average spend per council increased from $194 000 in 2007 to $239 000 in 2010.

The majority of the councils (71 per cent) reported receiving external funding, totalling $54.7 million in the financial year. This represents around 75 per cent external funding. Of this total, $26.3 million was funded by state governments to 140 recipients; an equal amount of $26.3 million was funded by the Australian Government to 58 councils; and $2.1 million was donated to 17 councils from other organisations such as private philanthropists and community organisations.

Councils had an average of one full time equivalent staff member working on cycling-related matters. Most councils did not have staff solely dedicated to cycling or active transport but, rather, cycling activities are undertaken as part of their duties – most are engineering, recreation or road safety staff. However, one metropolitan council reported having 25 full time equivalent staff working on cycling projects; another reported 15 full time equivalent staff.

Councils were asked to identify what was holding their communities back from being more involved in bicycle riding. The most common barriers cited were:

- urban planning – 'sprawl'
- transport planning – failure to consider active transport in transport planning, lack of public transport and lack of integration of public transport with active transport
- car dependency – ingrained nature of car use, social attitudes towards car ownership
- perceptions of safety
- perceptions of cycling as a sporting activity rather than a transport option
- lack of funding for infrastructure and programs
- incomplete infrastructure networks
- topography and weather
- community demographics – age, income, rate base
- negative media
- lack of political or internal leadership
- lack of community support
- lack of local cycling culture – including no nearby bike shop or mechanic.

As the owners and providers of most of bicycling infrastructure in Australia, local councils were also asked to identify what support was needed from the Australian Bicycle Council and others. Suggestions included:

- a call for all three levels of government to support cycling both strategically and financially
- better coordination and communication between neighbouring councils and levels of government: 'A consistent and coordinated approach to infrastructure, signage and programs between councils and resources that enable bicycle networks to be tackled at a regional rather than individual council level were mentioned numerous times'[139]
- reduced funding for road projects that do not cater to active transport needs
- better guidelines to improve the standard of cycling infrastructure (design, construction and maintenance) and treatments such as speed limits and traffic calming to best-practice international standards as well as guidelines on preparing feasibilities and strategies
- case studies on successful interventions, including international case studies
- access to promotional and safety programs and campaigns that could be adapted and used locally
- increased funding for regional network development, maintenance and Crown land purchase; increasing funding ratios from 1:1 to 2:1; and greater information about funding opportunities.

139 Australian Bicycle Council 2011, *Local Government Bicycle Account*, p25.

# 4.5 The role of business and community organisations

Peak business and community groups have been working together across a range of related areas, often in partnership with Commonwealth, state, territory and local governments, to support strategic advice and policy. The various sectors of health, environment, infrastructure and transport are increasingly recognising the co-benefits of active transport and public transport and are working together to reinforce the positive outcomes gained from more strategic alignment of policy, funding and implementation.

### Creating Places for People – an urban design protocol for Australian cities (www.urbandesign.gov.au)

Created as a partnership between peak professional, business and community groups and all three levels of government, the urban design protocol was launched in November 2011 by the Minister for Infrastructure and Transport. It articulates how more prosperous, sustainable and liveable places for people can be created through leadership and the integration of design excellence. It is championed by more than 40 organisations and has been incorporated into sustainability rating tools, including the Green Building Council of Australia's Green Star – Communities[140] and the Australian Green Infrastructure Council's Infrastructure Sustainability tool.[141]

Principles of Creating Places for People include 'connected' – people can get to and from destinations conveniently; 'walkable' – people can walk or ride bicycles easily around their neighbourhood; and 'vibrant' – there are things to see and do that encourage people to get out and about.

### Healthy Spaces and Places (www.healthyplaces.org.au)

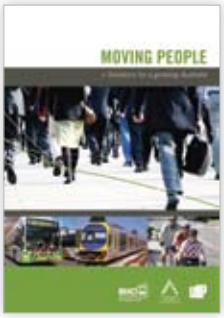
Healthy Spaces and Places is a partnership between the Planning Institute of Australia, the National Heart Foundation and the Australian Local Government Association. Funded by the Australian Government Department of Health and Ageing, it provides practical information from experts in health, planning, urban design, community safety and transport planning on how to design active, healthy communities.

The Department of Health and Ageing has provided additional funding to help support local government areas and the Healthy Communities Initiative (a component of the National Partnership Agreement on Preventive Health) in delivering effective community-based physical activity and healthy eating programs as well as developing a range of local policies that support healthy lifestyle behaviours.

140 Green Building Council of Australia: Green Star – Communities rating tool www.gbca.org.au/green-star/green-star-communities/rating-tool. Accessed 17 September 2012.

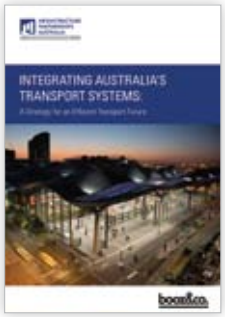
141 Australian Green Infrastructure Council: Infrastructure Sustainability tool www.agic.net.au/ISratingscheme1.htm. Accessed 17 September 2012.

### National Moving People strategy


An alliance of industry and community organisations – including the Bus Industry Confederation, National Heart Foundation, Cycling Promotion Fund, Australian Local Government Association, International Association for Public Transport, Australasian Railway Association and Planning Institute of Australia – has been working together to advocate a more comprehensive national approach to sustainable transport around Australia.[142]

### Integrating Australia's Transport Systems




Infrastructure Partnerships Australia's report on *Integrating Australia's Transport Systems: a strategy for an efficient transport future* argues for an integrated, multimodal approach to transport that is free of 'modal bias' – that is, transport planning and delivery should select the best mode of travel to support broader network outcomes. The report identifies five areas of integration: institutional, physical, network, information and fares. It surmises that active transport is highly cost-effective, from the user perspective, for short distance trips.

## Case study: Walk Score

Walk Score (www.walkscore.com) is a large-scale, public access walkability index that assigns a numerical walkability score to any address in a number of countries including Australia, Canada, the United States and New Zealand.

It calculates a location's proximity to a range of facilities and services such as retail, food, schools, entertainment and recreational facilities. If the closest establishment of a certain type is within 400 metres, Walk Score assigns the maximum number of points for that type. The number of points assigned declines as the distance approaches 1.6 kilometres and no points are awarded for further distances. One limitation is that it measures direct-line distances, not actual street connectivity. Nonetheless, it provides a useful proxy for the walkability of a location.

The index provides over six million scores every day and over 15 000 sites use Walk Score services, including some Australian real estate websites.

One study of residential properties in the US found that the premium commanded for neighbourhoods with above average Walk Scores ranged from about US$4 000 to US$34 000, depending on the location.[143]

Another study of commercial properties in the US based on Walk Score found that 'the benefits of walkability are capitalized into office, retail and industrial property values with more walkable sites commanding higher property values. On a 100 point scale, a 10 point increase in walkability increases property values by 1 to 9 per cent, depending on property type ... These types of properties with a Walk Score of 80 were worth anywhere from 6 to 54 per cent more than properties with a 20 Walk Score, depending on property type'.[144]

142 ALGA, BIC, CPF, Heart Foundation, UITP 2010, *An Australian Vision for Active Transport*.
143 CEOs for Cities 2009, *Research: Walking the Walk,* available from www.ceosforcities.org/work/walkingthewalk. Accessed 17 September 2012.
144 Pivo G and Fisher J 2011, 'The walkability premium in commercial real estate investments', *Real Estate Economics,* 39(2) pp185–219.

CHAPTER 5

# Overcoming barriers to walking and riding

Some locations have higher mode share of walking and riding than others. Underlying factors contributing to participation in active travel include whether these locations have continuous, convenient connections; environments that provide a sense of physical safety and personal security; good-quality mid- and end-of-trip facilities such as shade, seating, signage, lighting, drinking fountains, toilets and bicycle parking; and whether 'soft' encouragement programs are in place such as trip information, social media, skills training and behaviour change programs.

Walking and riding are less prevalent where a piecemeal approach to projects has been adopted and routes are not well linked to form a comprehensive network. Retrofitting these linkages at a later stage can be difficult and expensive.

Problems can also arise when policies and programs that have been established to address other issues have unintended negative impacts on walking and riding. An upgrade to a road may inadvertently cut off a pedestrian crossing or reduce the safety for bicycle riders by increasing vehicle speeds along a road. Large road and rail infrastructure can also dissect communities and cut off access between neighbourhoods. Such measures may:

- allow vehicles to travel faster along a road or through an intersection, reducing safety for pedestrians and bicycle riders
- improve the sense of safety for drivers, thus reducing their awareness of, or sensitivity to, other road users
- reduce the number of opportunities, or create longer distances, for pedestrians and riders to cross a road – leading to more risk taking
- reduce the safety zone, shoulder and/or road space for bicycles
- increase the overall distance or time it takes to walk to a local bus stop or train station.

## 5.1 Networks

Without convenient, safe and direct routes, people are less likely to choose walking and riding as a mode of transport.

The case study for Bull Creek in Perth (below) highlights a situation where, due to the layout of the existing street network, some houses that are only 260 metres from the train station in a direct line require a walk of up to 1570 metres along footpaths.

## Case study: Secure bicycle parking at train stations in Perth

Licence plate surveys have revealed some commuters drive less than 400 metres to park at crowded Perth train stations each morning. At Bull Creek station – which has a capacity of 598 vehicles – seven cars came from within 400 metres and another 19 came from 400–800 metres of the station. At Murdoch station, seven cars from within 400 metres and another 11 came from 400–800 metres away.

Park-and-ride facilities at Murdoch, Cockburn and Bull Creek stations are often full by 7.15am, resulting in motorists parking illegally or driving to their destination rather than catch public transport.

*Bull Creek train station, Perth: Lock'n'Ride bike shelter. Courtesy Stephen Hodge*

The State Government is rolling out a $50 million expansion of train station car parks, adding an extra 3000 bays along the Mandurah and Joondalup lines. In addition, 37 train stations are being upgraded to install secure bicycle parking cages, providing storage for up to 978 bicycles in total.

A cage of 21 bicycles takes up the same area as three car parking bays. People can pre-register to use a bicycle cage at their local train station, then access it for free using their public transport smart card. Although they still need to lock their bicycle within the cage, it is sheltered and can only be accessed by registered users. The aim is to have bicycle parking located closer to station entries than any other car parking bays (except disabled access).

One problem, however, is that local street networks don't always support good walking or riding connection to train stations. At Bull Creek station, some houses are only 260 metres from the station in a direct line, but require a walk of up to 1570 metres along the footpath.


Source: Google Earth (accessed May 2012)

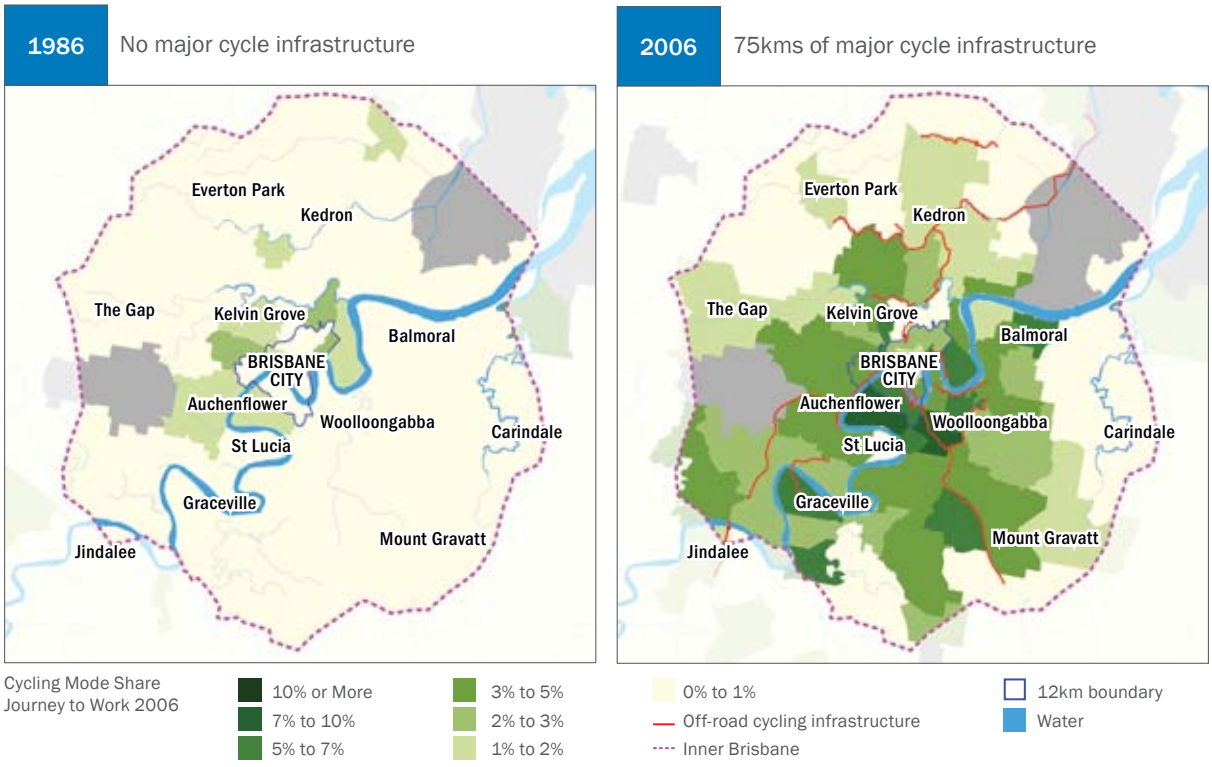
## Off-road bicycle network

Examples across Australia and internationally show that, where off-road bicycle networks are built, the number of people riding increases.

The case study of Portland, Oregon in section 2.2.1 showed a correlation between the amount of separated bicycle paths and the number of bicycle trips recorded. As more separated paths were built, more people chose to ride.

Similar increases in bicycle riding were recorded in Brisbane. The maps of inner Brisbane in Figure 5.1 show the extent of off-road bicycle networks in 1986 and 2006 and the corresponding mode shares of riding for census collection districts. In 1986 there were no off-road bicycle paths and a very low mode share for bicycling. By 2006 a significant network of off-road paths had been built and a corresponding increase in bicycling mode share was recorded. The increase was highest in suburbs near the off-road paths.

Figure 5.1 Off-road bicycle infrastructure provision and bicycle mode share in Brisbane




Source: *Queensland Cycle Strategy 2011.*

Sydney's metropolitan area has some of the lowest mode shares of bicycle riding of any city in Australia (see section 2.1.3). A contributing factor to this may be the comparatively few safe options for people to ride for short trips. Figure 5.2 shows the existing off-road or separated bicycle and shared path infrastructure for Sydney. It highlights that, although separated paths exist in some locations, these are not well connected to each other and do not enable people to easily ride to key employment centres, schools, universities, shops, public transport hubs or recreational facilities.

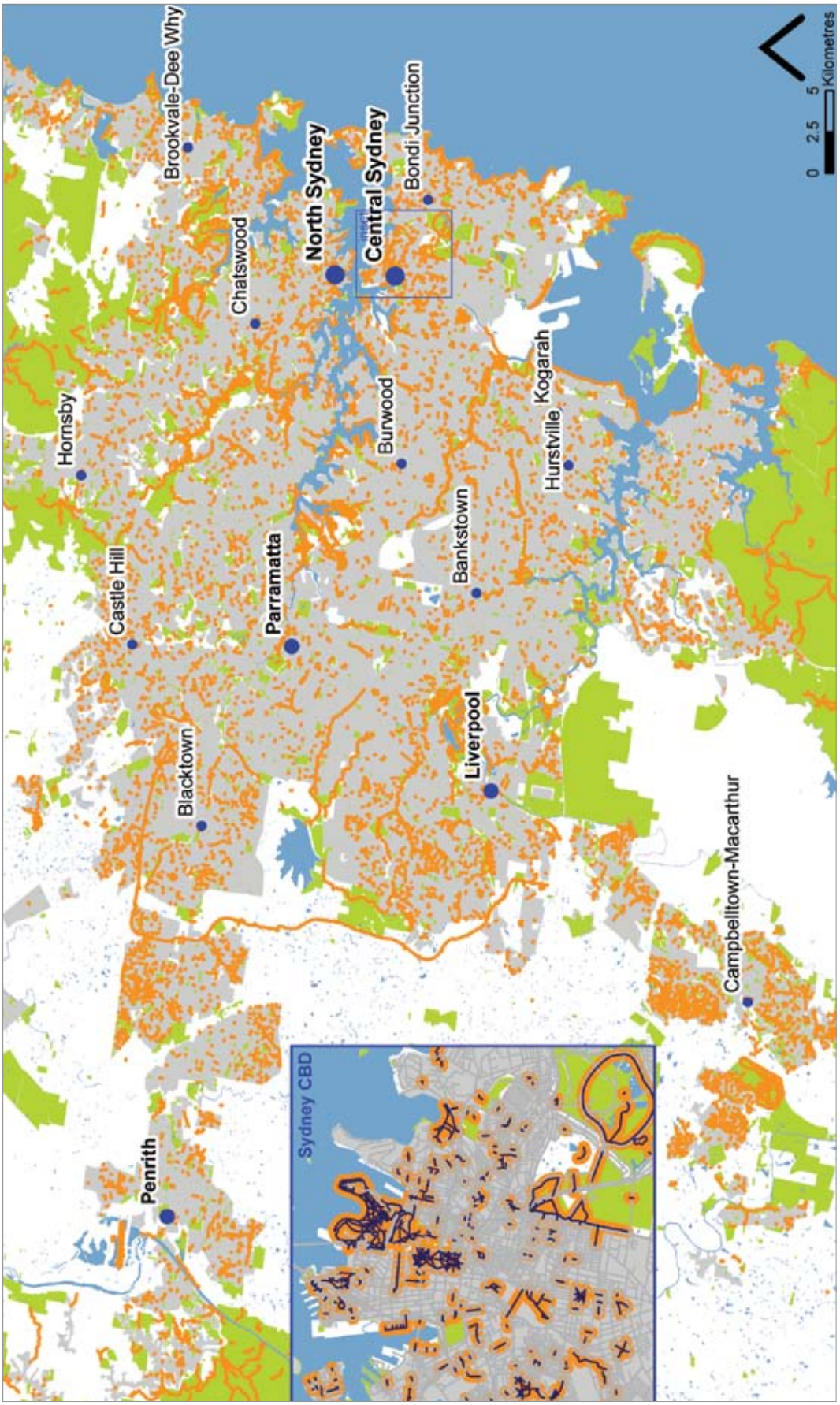



Figure 5.2 Sydney's existing off-road walking, cycling and hiking paths

Source: Department of Infrastructure and Transport analysis of Geoscience Australia data. Disclaimer: The Department cannot guarantee the accuracy of its sources.

Increasing use of active transport has been a goal of successive metropolitan plans for Sydney.[145]

In Sydney the active transport mode share for commuting increased by 0.5 per cent between 2001 and 2006 to reach 5.4 per cent. These shifts were largely confined to the inner and middle suburbs, with the outermost subregions (North West, South West, Central Coast) experiencing small declines in the proportion of residents walking to work. More recent data suggest the active transport mode share of commuter travel in Sydney continued to rise gradually from 2006 through to 2010.[146] Across all travel purposes (not just commuting) the active transport mode share has risen gradually over the decade from 17.8 per cent in 2001–02 to 19.1 per cent in 2009–10.[147]

Although Sydney and Melbourne share many similarities in terms of population size, per-capita income, car ownership, political systems and climate (albeit with Sydney's milder winters), Melbourne has a much greater proportion of regular bicycle riders and is experiencing more rapid growth in riding mode share.[148] According to the *National Cycling Participation Survey*, 18 per cent of Melbourne residents ride at least once a week compared with Sydney, with only 11 per cent[149] (see section 2.1.3). The mode share for all walking, riding and public transport trips in each of Melbourne's local government areas was shown at Figure 2.6 above.

A study comparing bicycling trends and policies in Sydney and Melbourne conjectured that the major differences between the cities appear to be topography, policy and provision. Firstly, Sydney is much hillier (requiring greater exertion and diverting key arterial routes along ridge lines) and divided by the harbour (with only a handful of harbour crossings versus more than 20 across the Yarra).[150] The study said that the flatter topography may explain the higher proportion of people riding in Melbourne but did not explain why Melbourne is experiencing a much higher rate of growth than Sydney.

The second major reason offered by the study was the difference in accessibility:

> *Local streets in many of Melbourne's inner suburbs provide direct access to the CBD. By comparison, many local streets in Sydney's inner suburbs are cut off by motorways or major arterials as well as the expansive harbour and other natural barriers. That difference might help explain why the bicycle share of work trips in Yarra (7.5 per cent) is three times higher than in Marrickville (2.5 per cent) although the two localities are very similar in their topography, proximity to the centre, demographics, and development patterns.*[151]

145 NSW Government 2005, City of Cities: a plan for Sydney's future; and NSW Government 2010, Metropolitan Plan for Sydney 2036.
146 Bureau of Transport Statistics 2011, 2009–10 Household Travel Survey summary report (2011 release), NSW Bureau of Transport Statistics.
147 *Ibid.*
148 Mees P, Sorupia E & Stone J 2007, Travel to work in Australian capital cities, 1976–2006: an analysis of census data.
149 Australian Bicycle Council 2011, Household National Cycling Participation Survey.
150 Pucher J, Garrard J & Greaves S 2010, 'Cycling down under: a comparative analysis of bicycling trends and policies in Sydney and Melbourne', *Journal of Transport Geography,* 19(2011) pp322–345.
151 *Ibid.,* p337.

The existing off-road network maps for Sydney (Figure 5.2) and Melbourne (Figure 5.3) illustrate that Melbourne's off-road network is more comprehensive and continuous than Sydney's.

Melbourne's off-road network connects relatively well with the CBD but not with some of the other major activity centres.[152] Sydney's off-road network does not connect to either the CBD or the major activity centres identified in the *Metropolitan Plan for Sydney 2036*.

The concentration of new facilities near the centre is due to an explicit policy giving priority to cycling infrastructure improvements within a 10-kilometre radius of the centre of Melbourne: 'That is where roadway congestion is worst, and where a modal shift away from the car to the bicycle is most needed as well as the most feasible, given the shorter trip distances, mixed land use, and higher density near the centre'.[153]

The study concluded that:

> *The bulk of evidence suggests more favourable policies toward cycling in Melbourne than in Sydney. In particular, Melbourne has more and better integrated cycling infrastructure, which has been strategically focused on the commuting routes into the CBD. By comparison, many of Sydney's cycling facilities have been ad hoc, uncoordinated, and often located along motorways in the suburbs with limited usefulness for daily commuting. In addition to better infrastructure provision, Melbourne also benefits from much more extensive cycling programs, advocacy, and promotional events. Finally, Melbourne benefits from safer cycling than in Sydney, which suffers from a lack of traffic-separated cycling facilities.*[154]

152 Victorian Auditor-General 2011, *Developing Cycling as a Safe and Appealing Mode of Transport – an audit of the 2009 Victorian Cycling Strategy.*
153 Pucher J, Garrard J & Greaves S 2010, 'Cycling down under: a comparative analysis of bicycling trends and policies in Sydney and Melbourne', *Journal of Transport Geography*, 19(2011) p337.
154 *Ibid.*, p343.

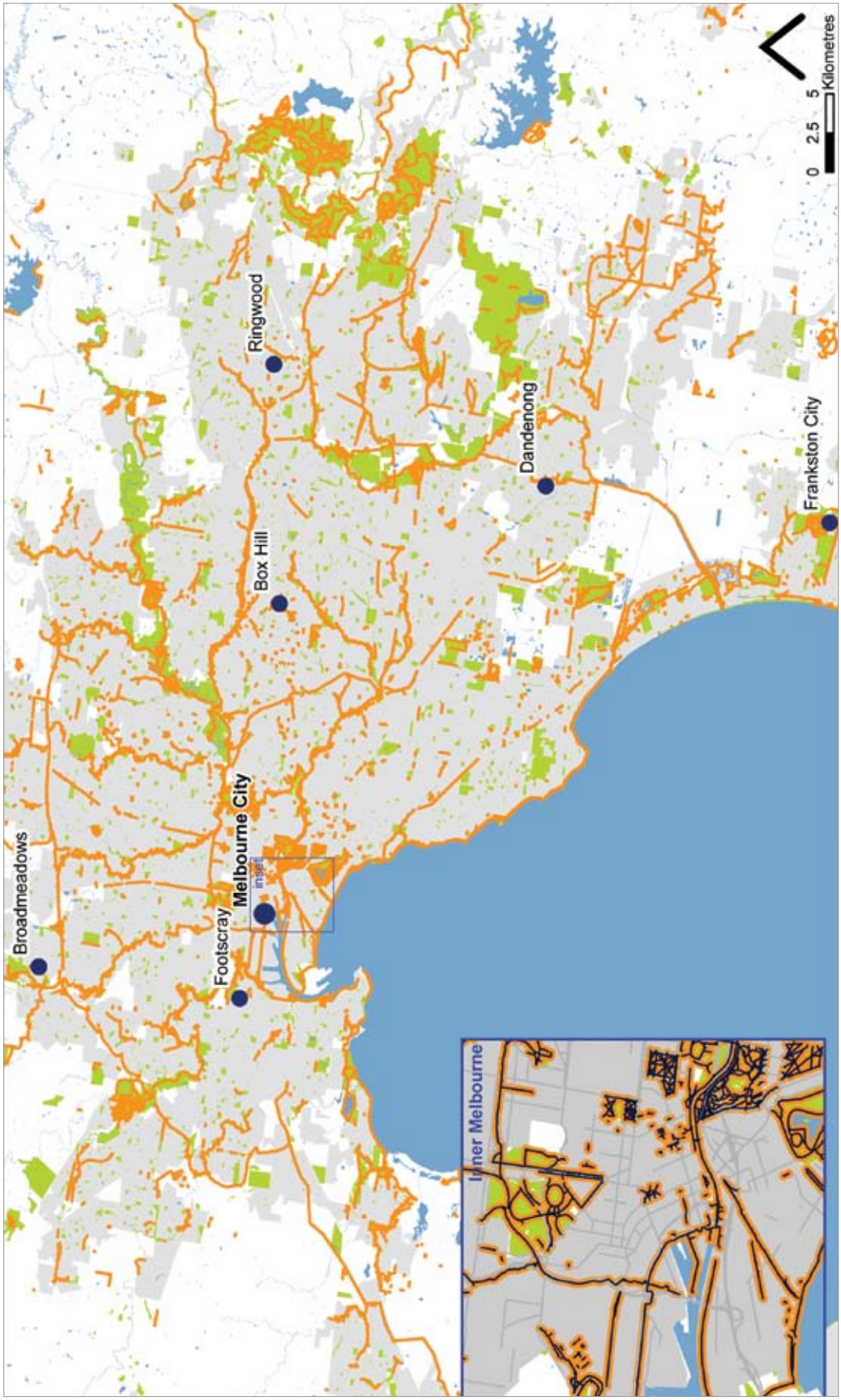



Figure 5.3 Melbourne's existing off-road walking, cycling and hiking paths

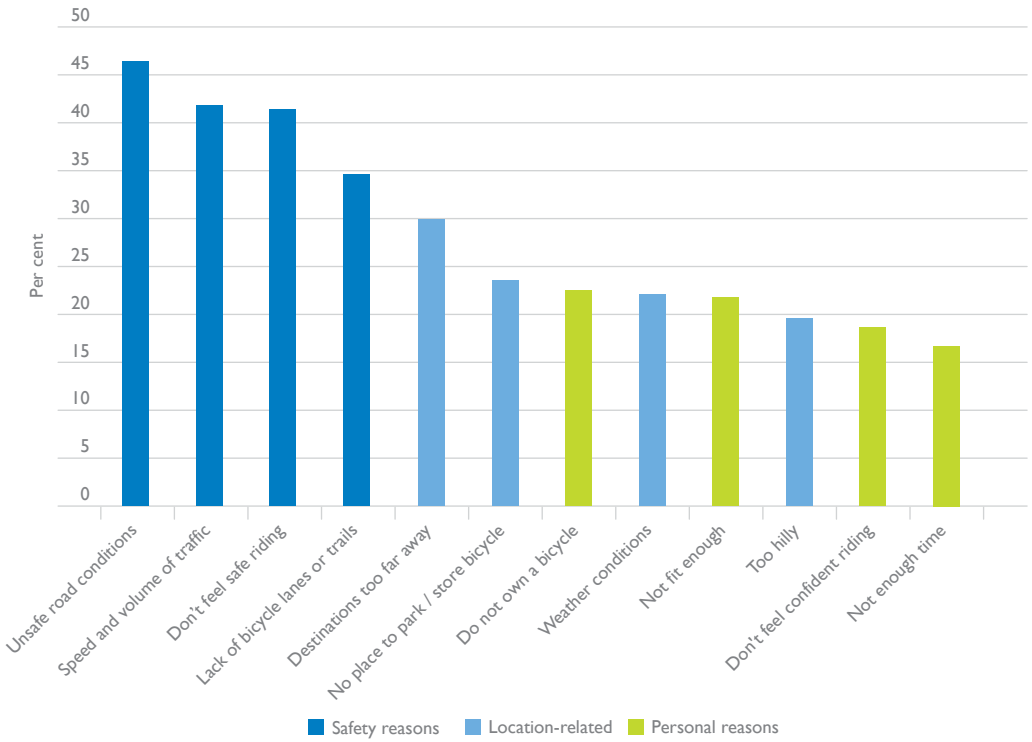
Source: Department of Infrastructure and Transport analysis of Geoscience Australia data. Disclaimer: The Department cannot guarantee the accuracy of its sources.

# 5.2 Physical safety

Concerns about physical safety are a major barrier to greater participation in walking and riding for transportation purposes.

A 2011 survey found that over 15 per cent of Australian adults would seriously consider riding for transport purposes, but road safety fears prevent them from taking it up.[155] Over 84 per cent said that paved trails and pathways physically separated from traffic would encourage them to ride a bicycle more often and 64 per cent said bicycle lanes on roads would also help. Their reasons for not riding a bicycle for transport purposes included unsafe road conditions, speed and volume of traffic, not feeling safe and a lack of lanes or trails (Figure 5.4).

Figure 5.4 Reasons for not riding a bicycle for transport




Source: Cycling Promotion Fund and National Heart Foundation of Australia 2011, *Riding a Bike for Transport*, table 11.

Much of the infrastructure today is used by people who are already confident bicycle riders (see Figure 2.17). In New South Wales, women represent only 17 per cent of commuter bicycle riders.[156] A nationwide survey found that only 13.5 per cent of the female population had ridden a bicycle for any purpose in the last week compared with 22 per cent of the male population.[157] Designing and building appropriate infrastructure to improve safety for all walkers and riders is vital to encourage greater participation.

155 Cycling Promotion Fund and National Heart Foundation of Australia 2011, *Riding a Bike for Transport: 2011 survey findings*, available from www.cyclingpromotion.com.au/images/stories/MediaReleaseDocs/CyclingPromotionFund_Riding_a_Bike_for_Transport_Survey_Report_2011.pdf. Accessed 17 September 2012.

156 Parsons Brinckerhoff, 2008, *Cycling in New South Wales: what the data tells us*, prepared for Premier's Council of Active Living, p25.

157 Australian Bicycle Council 2011, *Australian Cycling Participation Survey: Reporting for the National Cycling Strategy 2011–2016*, table 4.4.

Numerous examples exist across Australia of infrastructure treatments that discourage walking or riding. The images in Figure 5.5 illustrate examples of on-road bicycle lanes and shoulders in high-speed and high-traffic environments. Although these types of infrastructure are sometimes used by very confident bicycle riders, they do not provide the levels of safety required to persuade a larger proportion of the population to consider riding.

Improving infrastructure has the potential to significantly increase safety for all road users, including bicycle riders and pedestrians, children and the elderly. Improvements include the separation of bicycles and pedestrians from motor vehicles (using footpaths and bicycles paths); separation of bicycles from pedestrians where conflict occurs; provision of signalised crossings, including pedestrian and bicycle priority crossings; and, in areas of high pedestrian activity such as schools or shopping zones, the slowing of traffic speeds.

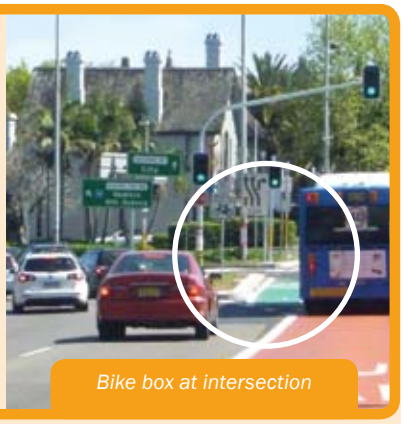
Figure 5.5 On-road bicycle treatments that do not provide an ideal level of safety

**Shoulders** beside urban freeways with large traffic volumes and high speed

**On road** bicycle lanes in areas of high pedestrian and bicycle activity, large traffic volumes, and high vehicle speeds

*Rider approaching bike box*

*Rider's view of bike box ahead*



*Bike box at intersection*

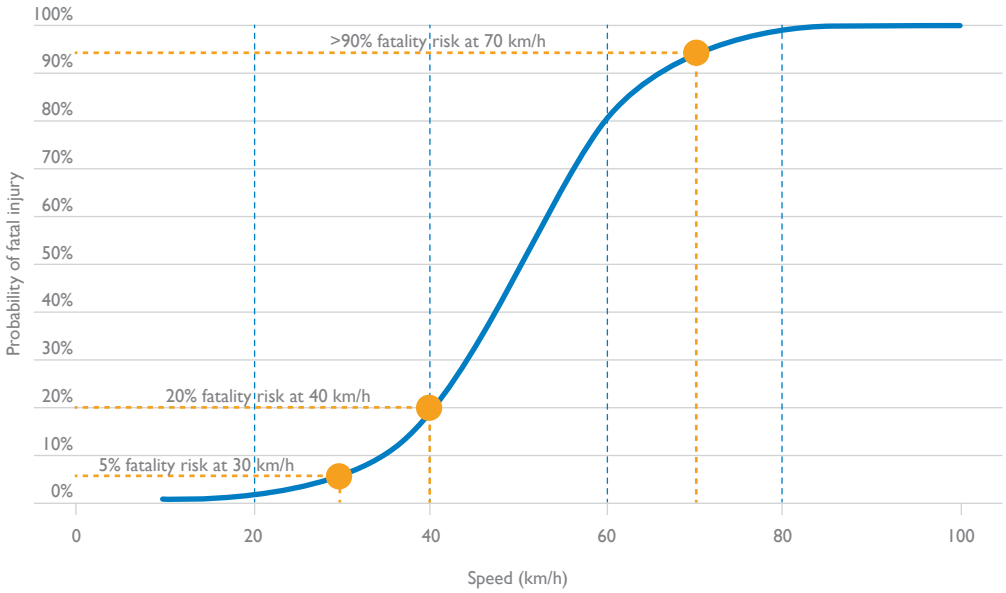
**Infrastructure** that is inaccessible or inappropriate for use by most people, including children and the elderly

## Separation from vehicles

The Safe System approach is based on the principle that, in the event of a crash, impact energies must remain below the threshold likely to result in death or serious injury.[158]

Most pedestrians will not survive being hit by a vehicle travelling over 50 kilometres per hour. Figure 5.6 shows that the chances of survival for an unprotected pedestrian hit by the front of a passenger vehicle diminish rapidly from impact speeds greater than 40 kilometres per hour. At 30 kilometres per hour the likelihood of a fatality is 5 per cent; at 40 kilometres per hour it is 20 per cent; at 60 kilometres per hour it is 80 per cent; and at 70 kilometres per hour it is more than 90 per cent. Note that this does not include pedestrians hit by sports utility vehicles, light commercial vehicles or trucks.

### Figure 5.6 The impact of vehicle speed on fatality rates for pedestrians




Source: Austroads 2012, *On road Cycling on Higher Speed Roads*.

## Shared traffic

Whilst it is preferable, in most situations, to reduce the risk of crashes through infrastructure measures such as physical separation, it is not always cost-effective or appropriate. In areas of high pedestrian activity, such as around schools, universities, hospitals, entertainment and shopping districts, or public transport interchanges, reducing traffic speeds may be the most appropriate course of action.

All states have adopted a default urban speed limit of 50 kilometres per hour. The *National Road Safety Strategy 2011–2020* reported that this change was linked to a 20 per cent reduction in casualty crashes, with even greater reductions in serious injuries. Community surveys found that public support for the 50 kilometre limit increased after the change was implemented.[159] A South Australian study found that, because many local streets were already low-speed environments, the signposted reduction from 60 to 50 reduced actual driven speeds by only 3.75 kilometres per hour but led to a 23 per cent reduction in crashes resulting in casualties.[160]

158 OECD and International Transport Forum 2008, Towards Zero: *Ambitious Road Safety Targets and The Safe System Approach* www.internationaltransportforum.org/jtrc/safety/targets/08TargetsSummary.pdf. Accessed 17 September 2012.

159 Australian Transport Council 2011, *National Road Safety Strategy 2011–2020*, p13.

160 Centre for Automotive Safety Research 2006, *A follow-up evaluation of the 50km/h Default Urban Speed Limit in South Australia,* http://casr.adelaide.edu.au/casrpubfile/77/CASRevaluation50kmh583.pdf. Accessed 19 September 2012.

Most states have also adopted 40 kilometre speed limits around schools. The *National Road Safety Strategy 2011–2020* reports that 'Safety outcomes in higher-risk pedestrian and school areas were improved through the introduction of 40 km/h and lower limits. For example, School Speed Zones adopted in Victoria in 2003 resulted in a 23 per cent reduction in casualty crashes and a 24 per cent reduction in all pedestrian and bicyclist crashes outside schools'.[161]

Local governments across Australia are adopting local speed limits, on a case-by-case basis, in areas of high pedestrian activity. Figure 5.7 provides a selection of such examples.

### Figure 5.7 Selected local government 40km/h local speed zones

| Local Government | Speed limit applied | Description of area |
|---|---|---|
| **Brisbane, QLD** | 40km/h area | Brisbane CBD, since 2007 |
| **Unley, SA** | 40km/h area | Citywide 40km/h limit on all local roads, introduced 1999 |
| **Rosebud, VIC** | 40km/h zone | In 'The Avenues' residential area, 12-month trial commencing March 2012 |
| **Perth CBD, WA** | 40km/h area | Extending existing areas to most of Perth CBD and Northbridge, from June 2011 |
| **Victoria Park, WA** | 40km/h street | Albany Highway near Great Eastern Highway, from May 2010 |
| **Mt Lawley, WA** | 40km/h street | Beaufort St, 7:30am to 10pm most weekdays, since August 2009 |
| **Leederville, WA** | 30km/h street | Oxford St entertainment district |
| **Kalamunda, WA** | 40km/h street | Zig Zag Scenic Drive, from May 2012 |

Source: various state and local government websites.

There are also many international examples, as described in the case study below.

Australian research has shown that the risk of a serious casualty crash doubles with a five kilometre per hour speed increase on 60 kilometre per hour urban roads. Analysis in Western Australia has shown that if every driver slowed down by one kilometre per hour there would be 5 per cent fewer people killed and 3.5 per cent fewer serious injuries resulting in hospitalisation.[162]

Section 6.2.1 of this paper discusses the types of treatments that could be considered in order to improve road safety for all road users.

161 Australian Transport Council 2011, *National Road Safety Strategy 2011–2020*, p13.
162 *Ibid.*, p60.

### Case study: International examples of low-speed neighbourhoods

Area-wide traffic calming has been used extensively in France, the United Kingdom and Switzerland as part of their broader strategies to increase the use of walking and bicycling for transportation. Many European cities have adopted 'Zone 30', which restricts speeds in certain urban areas to 30 kilometres per hour.

Graz, Austria, first implemented a citywide 30 kilometre zone in 1992; they are now ubiquitous in cities across the Netherlands, Switzerland and other European countries and are gaining popularity in the United Kingdom and the United States.

The introduction of 20 mile per hour (30 kilometre per hour) zones in London resulted in a 42 per cent reduction in fatalities. New bicycle lanes also helped to decrease the rate of bicycle-related crashes while increasing the number of bicycle riders by 58 per cent over three and a half years.[163]

New York City is currently piloting reduced neighbourhood speed zones, with speed limits of 20 miles per hour (30 kilometres per hour). There the installation of bicycle lanes decreased injuries to bicycle riders by 57 per cent and to pedestrians by 29 per cent.[164]

## 5.3 Personal safety and comfort

*Creating Places for People: an urban design protocol for Australian cities* is championed by more than 40 organisations, including all three levels of government and peak business and community organisations.[165] The protocol contains a number of principles for quality urban places, including:

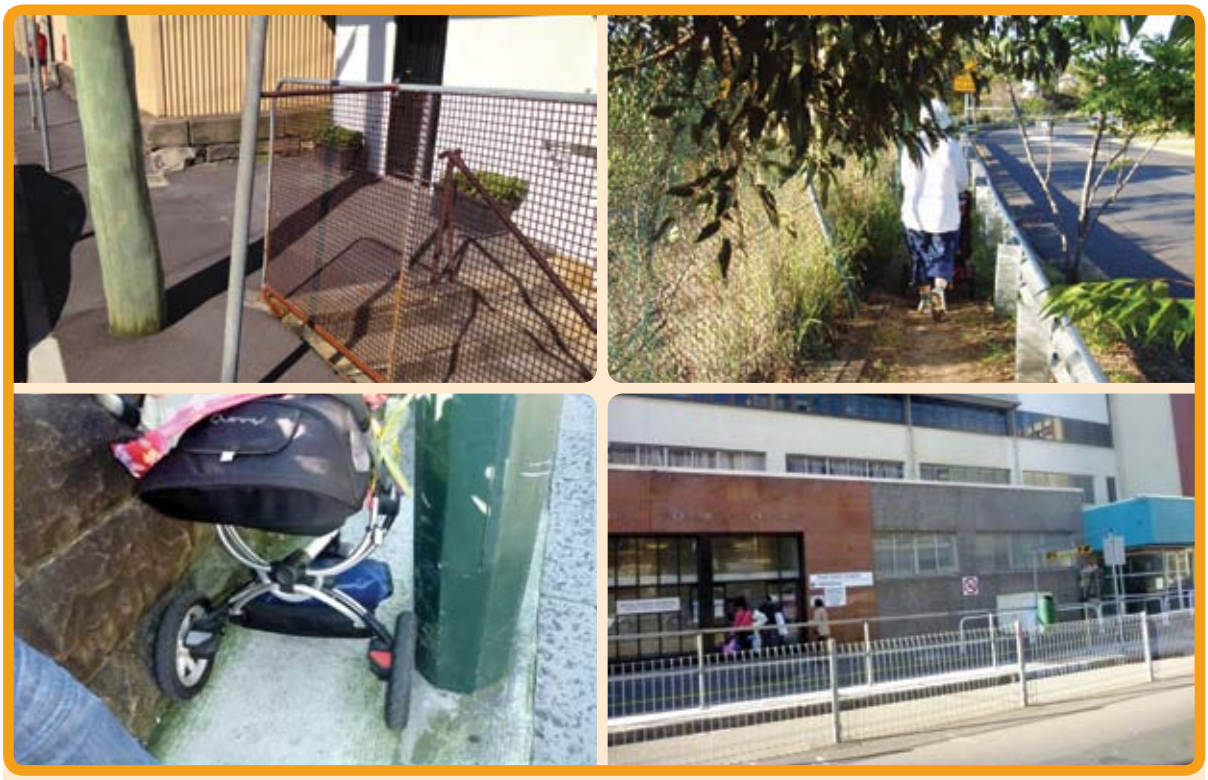
- Safe – it feels safe and secure even at night or on your own; roads and paths are safe for adults and children to walk or ride their bikes.
- Walkable – enjoyable and easy to walk and ride around; buildings and streets feel like they are the right size and type for that place.
- Comfortable – it feels comfortable to walk through, sit, stand, play, talk, read; it is not too exposed to unpleasant noise, wind, heat, rain, traffic or pollution.
- Vibrant – you can see that there are people around.

Environments that lack these qualities can feel hostile and uninviting and may increase opportunities for crime to occur. Most states and territories have developed guidelines, such as Crime Prevention Through Environmental Design (CPTED), to assist in addressing these issues.[166]

Examples of infrastructure that discourages walking and riding due to concerns about personal safety, or lack of convenience and comfort, are illustrated in Figure 5.8 below.

163 Toronto Public Health 2012, *Road to Health: Improving Walking and Cycling in Toronto.*
164 *Ibid.*
165 Australian Government 2011, *Creating Places for People: an urban design protocol for Australian Cities* www.urbandesign.gov.au
166 Australian Government 2011, *Creating Places for People: an urban design protocol for Australian Cities* www.urbandesign.gov.au/protocolframework/principles/safe.aspx. Accessed 17 September 2012.

Figure 5.8 Examples of environments that lack convenience, the feel of personal safety or comfort



**Physical barriers** that prevent ease of access across roads or along footpaths

**Lack of ramps or other alternatives** for wheelchairs,prams and bicycles

**Figure 5.8 Examples of environments that lack convenience, the feel of personal safety or comfort *(cont.)***

Paths and streetscapes that lack **passive surveillance** or create a sense of entrapment

**Poorly maintained** paths, streetscapes and parks

**Narrow footpaths** on busy roads

## 5.4 Awareness, skills and incentives

The TravelSmart program, supported in part by the Australian Government as well as each of the states and territories, focuses on travel behaviour change in workplaces, schools and neighbourhoods. More details on this program are provided in Appendix D of this paper.

Skills training and promotional activities to encourage safe walking and bicycle riding are also coordinated by non-government organisations including AustCycle (see case study below) and bicycle user groups organising Ride2School, Walk2School, and Ride2Work days.

As described in section 2.2.1 of this paper, the United Kingdom has implemented a wide range of policies and programs aimed at encouraging greater participation in walking, riding and use of public transport.

It has a tax exemption in place that allows employers to loan bicycles and safety equipment to employees as a tax-free benefit.[167] It has funded programs such as Cycling Demonstration Towns and Cycling City and Towns to encourage 'more people to cycle, more safely and more often' using a mix of infrastructure and promotion. Initial assessments of these programs have shown positive benefit–cost ratios and resulted in increased participation in active travel.[168] Significant funds have also been spent to introduce bicycle skills training through the national Bikeability scheme.[169]

### Case study: AustCycle

AustCycle was established in 2008 as a joint initiative of Cycling Australia, the Amy Gillett Foundation and the Bicycle Federation of Australia. It currently receives funding from the Department of Health and Ageing and the NSW Office of Environment and Heritage to run education and training programs that encourage adults and children to ride a bicycle safely and with confidence.

AustCycle conducts accredited training courses for instructors and, through a national provider network, trains communities of all ages and backgrounds. The program attempts to address concerns about safety, which for many Australians is a major barrier to riding a bicycle. The training encourages participants to practice skills, develop safer riding behaviours and apply skills to traffic scenarios.

AustCycle's evaluation of training programs, conducted as part of the Healthy Communities Initiative under the National Partnership Agreement on Preventive Health, found that:

- nine out of 10 participants reported an increase in their bicycle handling and traffic skills
- nine out of 10 of participants reported an intention to continue to cycle
- one in five said they would ride for transport purposes in the future.

The results were even stronger for children, with 100 per cent indicating they had improved their bicycle handling skills and 99 per cent intending to continue riding a bicycle.

167 UK Department of Transport 2011, *Cycle to work scheme guidance.*
168 UK Department of Transport 2011, *Evaluation of the Cycling Cities and Towns Programme: interim report*
169 UK Department for Transport 2012, *Bikeability: 'cycling proficiency' for the 21st Century,* available from www.dft.gov.uk/bikeability

CHAPTER 6

# Opportunities to increase walking and riding for transport

This chapter explores opportunities to address the barriers outlined in Chapter 5 and proposes a number of initiatives. With the objective of improving the efficiency of our transport systems – by increasing the mode share of walking and riding for short trips and improving access to public transport – the following proposed initiatives are explored:

### PLANNING: Including walking and riding when planning for land use and transport

1. **Working within a clear hierarchy of planning**

   Integrating land use and transport planning; and identifying principal walking and riding routes in state, territory, regional and local plans.

2. **Designing networks of continuous, convenient connections**

   Enabling short walking and riding trips for transport purposes; improving access to and within major activity centres; and improving access to public transport stops.

### BUILDING: Building appropriate infrastructure for walking and bicycling needs

3. **Creating safe environments for pedestrians and bicycle riders**

   Separating pedestrians and bicycle riders from vehicles, particularly in high-speed and high-volume traffic; sharing road space, with appropriate speeds, in high-pedestrian environments; and recognising the vulnerability of bicycles as road vehicles.

4. **Incorporating pedestrian and bicycle facilities when building other infrastructure**

   Recognising 'positive provision' policies of states and territories; avoiding costly retrofitting; and incorporating mid- and end-of-trip facilities.

### ENCOURAGEMENT: Encouraging greater participation in walking, riding and public transport

5. **Leveraging infrastructure investment**

   Considering programs and incentives to encourage greater participation in walking, riding and public transport; and improving awareness and skills in the broader population.

6. **Providing consistent standards and guidelines, monitoring and evaluation**

   Supporting nationally consistent guidance and sharing of best practice; improving monitoring and evaluation, and developing nationally consistent decision-making processes.

# 6.1 Planning

In planning for walking and riding networks, consideration needs to be given to broader issues of integrated land use and transport planning; density; access to jobs, schools and universities, services and facilities; and access to public transport.

The *National Cycling Strategy 2011–2016* includes a priority for integrated planning (see Appendix A), the objective of which is to 'consider and address cycling needs in all relevant transport and land use planning activities'. It suggests action areas to develop and publish state and territory cycling action plans that include targets consistent with the national target of doubling participation in cycling by 2016; that local governments should take into account the state and territory plans; and that all governments will take into account active transport needs in their land use planning and infrastructure strategies.

The following recommendations broaden the scope to include walking as well as cycling:

**PLANNING: To include walking and riding when planning for land use and transport**

1. **Working within a clear hierarchy of planning (section 6.1.1)**
   a. integrating land use and transport planning
   b. identifying principal walking and riding routes in state, territory, regional and local plans that are consistent with overall metropolitan plans.

2. **Designing networks of continuous, convenient connections (section 6.1.2)**
   a. enabling short walking and riding trips for transport purposes
   b. improving access to and within major activity centres, particularly 20-minute walking and riding catchments
   c. improving access to public transport stops.

## 6.1.1 Recommendation 1: Working within a clear hierarchy of planning

In December 2009, the Council of Australian Governments (COAG) agreed to an objective and nine criteria for capital city strategic planning, recognising that 'the efficient and effective planning of our cities and towns is vital to productivity and investment'.[170]

The COAG Reform Council was tasked with reviewing capital city strategic planning systems to establish the extent to which they met the COAG agreed criteria. The review found that 'many of the problems of congestion, poor design and lack of infrastructure related to poor planning in the past'.[171] The criteria for capital city planning systems included two that are particularly relevant in planning for comprehensive public transport, walking and riding networks:

1. integration across functions, including land-use and transport planning, and
2. a consistent hierarchy of future oriented and publicly available plans including long-term integrated strategic plans, and medium-term prioritised infrastructure and land use plans.

170 COAG 2009, Capital city strategic planning systems, www.coagreformcouncil.gov.au/agenda/cities.cfm
171 COAG Reform Council 2012, *Chairman's statement*, 2 April 2012, on capital city planning system reforms.

The Australian Bicycle Council, in conjunction with the Department of Infrastructure and Transport, issued a report in 2005 (republished in 2008) which explicitly recognised that the highest priority for bicycle infrastructure in Australia is the development of strategic networks, particularly the completion of missing sections in the networks so as to provide whole-of-network connectivity.[172, 173]

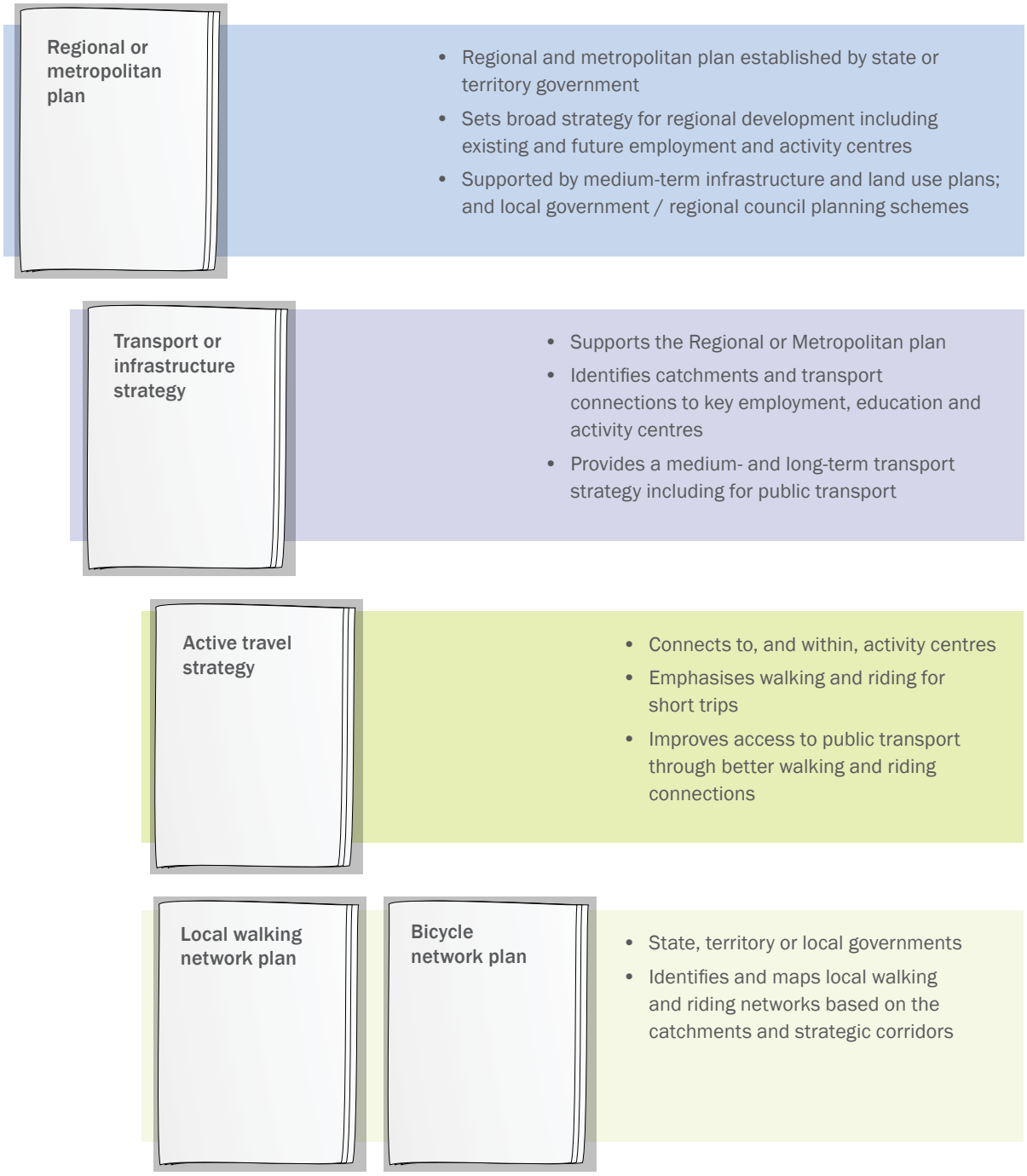
Austroads, in its summary paper, *Cycling Aspects of Austroads Guidelines* (2011), stated that:

> *The development of strategies is important because they provide a framework and direction for the development and coordination of programs throughout government and should constitute a commitment to various initiatives and actions. They also provide for the integration of cyclist needs into all planning and design activities including commercial and industrial building designs, land development plans, subdivision plans, road designs and road maintenance programs.*
>
> *Therefore bicycle planning needs to include:*
>
> - *development of broad bicycle policies and bicycle strategies at both national and state levels which includes all aspects of cycling, involves all relevant departments and municipalities, and assigns responsibilities*
> - *development of local strategic bicycle plans on a municipal basis which set local strategies and define local bicycle networks in relation to the principal or regional bicycle network (if one exists). These plans should also identify local needs for programs, and for road and path improvements.*
>
> *These strategies and plans provide a statement of actions which are based on encouragement, education, engineering and enforcement.*[174]

In line with the Austroads recommendation, a suggested hierarchy of planning is presented at Figure 6.1, showing a 'line of sight' from regional or metropolitan plans through to transport and infrastructure strategies, and walking and bicycling plans.

172 Australian Bicycle Council and the Department of Infrastructure, Transport, Regional Development and Local Government 2008, *Prioritisation of Bicycle Infrastructure Proposals*.
173 Australian National Audit Office 2012, p61.
174 Austroads 2011, *Cycling Aspects of Austroads Guidelines*, p5.

Figure 6.1 Suggested hierarchy of strategies and plans, from regional to local networks



### 6.1.2 Recommendation 2: Designing networks of continuous, convenient connections

Having access to well-connected, continuous and convenient routes is an important factor in any transportation system, whether it is for freight vehicles, cars, public transport, walking or riding.

Around 20 per cent of the Australian population commutes less than five kilometres to work or study (see section 2.1.1). Analysis of census data, as well as surveys of household travel preferences,[175] confirms that distance is one of the most important factors for whether people will consider walking or riding for their daily commute.

There is a significant opportunity to shift from vehicle use to walking and riding for short distances. This could be achieved, at least in part, by concentrating on 20-minute catchments (two kilometres walking and five kilometres riding) around major activity centres.

Figure 6.2 maps 20-minute walking and riding catchments for major activity centres and employment lands in the Sydney metropolitan area using existing local roads and off-road paths. To create this map, areas of high employment density and activity were identified based on the *Metropolitan Plan for Sydney 2036* and 2006 Census data. Two- and five-kilometre routes from these points were then mapped along local streets and off-road paths. Arterial roads and freeways were not included in the network analysis. Such a catchment planning methodology has been used elsewhere in Australia to focus and prioritise walking and riding infrastructure investment to create comprehensive networks in the most appropriate areas.

The map shows that there are significant parts of Sydney within a 20-minute walk or ride of a major employment or activity centre. It shows that, when seen as a whole, the five-kilometre bicycle riding catchments start to join up to create a continuous connection between many of the major activity centres and their surrounding neighbourhoods. It also shows that a large proportion of the metropolitan population could directly benefit from improving the safety of local roads and providing high-quality off-road paths within these catchment areas.

Note that Figure 2.5 above charted the existing mode share of active travel and public transport to Sydney's major activity centres.

Some potential catchments to activity centres are cut off by freeways, arterial roads, large industrial areas or water bodies such as the harbour. For example, there is very poor walking or riding access to the east of Liverpool (hence it has as little as 4 per cent mode share for walking and riding); to the south of Macquarie Park (which has only 3 per cent active travel mode share); and to the north of Norwest Business Park (1 per cent).[176]

Increasing the mode share of active travel could also help to reduce traffic congestion around these key employment centres.

175 ABS 2009, *Environmental Issues: Waste Management and Transport Use,* cat. no. 4602.0.55.002.
176 BITRE 2012, analysis of NSW Bureau of Transport Statistics compilation of 2006 Census data, unpublished.

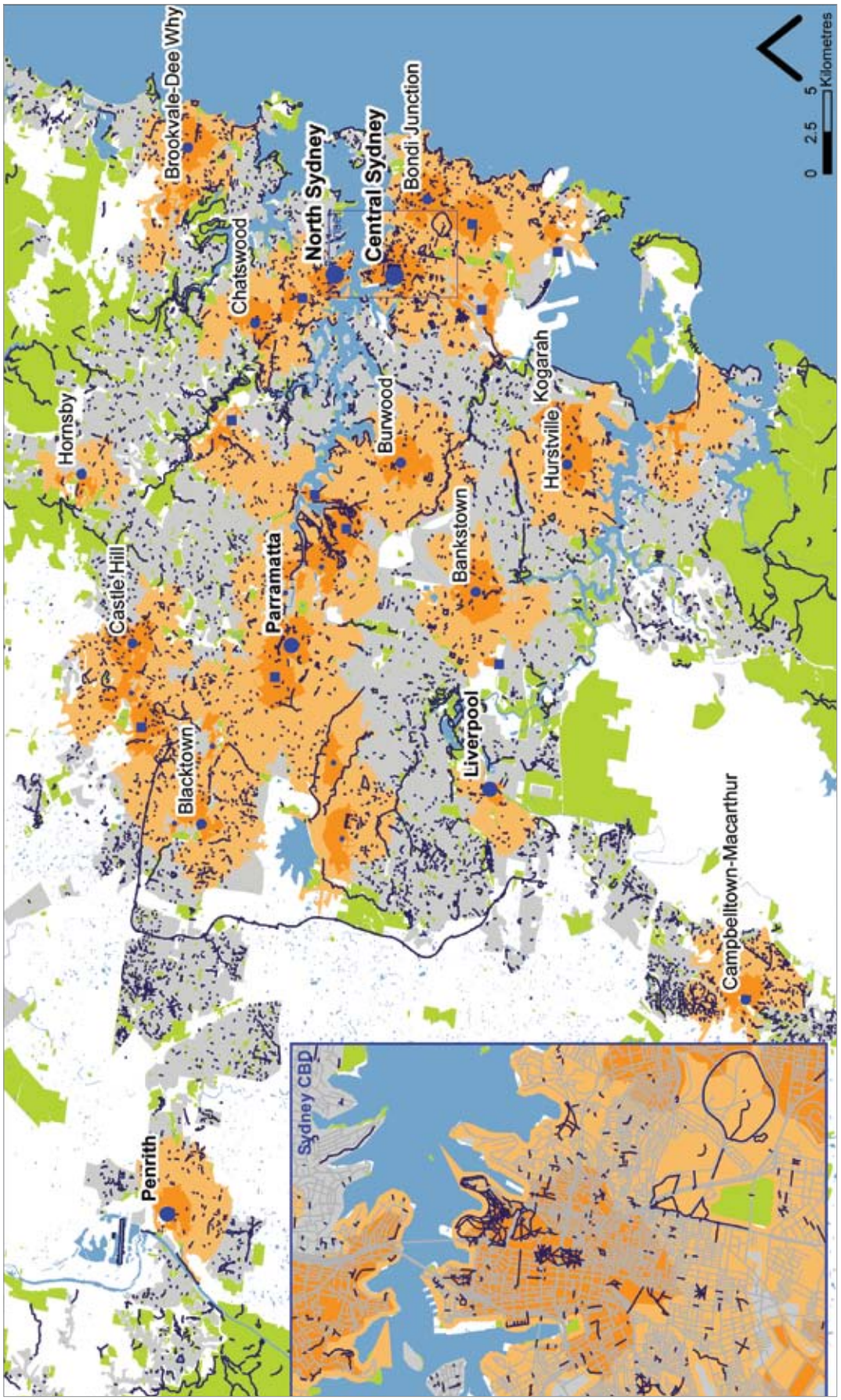



Figure 6.2 Potential 20-minute walking (2km) and riding (5km) catchments on Sydney's local roads

Source: Department of Infrastructure and Transport analysis of Geoscience Australia data. Disclaimer: The Department cannot guarantee the accuracy of its sources.

### Better connections to public transport hubs

There is also significant opportunity to improve catchments for public transport – to train stations, bus, tram and light rail stops, and ferry terminals.

Depending on the circumstances, retrofitting for better connectivity may be extremely difficult or it may simply be a matter of removing minor barriers to pedestrian or bicycling access.

In the map shown at Figure 1.5 above, the installation of a 30-metre pathway significantly expands the catchment of a train station, allowing an additional 200 houses to be within a five-minute walk of the station.

The catchment area for public transport stops is smaller than for major activity centres. Research from Australia,[177] North America[178, 179] and Europe[180] suggests that people are prepared to spend about 10 minutes walking or riding to a high-frequency, direct public transport service such as a train or express bus.[181] This equates to 800 metres walking or two to three kilometres riding. For less frequent or indirect local services, people are generally prepared to walk for up to five minutes (400 metres walk).

It therefore makes sense to provide a range of options for public transport: express services with a limited number of stations or stops that have broader catchments; and local neighbourhood services with frequent stops.

## 6.2 Building

The following recommendations apply:

**BUILDING: To build appropriate infrastructure for walking and bicycling needs**

3. **Creating safe environments for pedestrians and bicycle riders (section 6.2.1)**
   a. separating pedestrians and bicycle riders from vehicles, particularly in high-speed and high-volume traffic
   b. sharing road space, with appropriate speeds, in high-pedestrian environments
   c. recognising the vulnerability of bicycles as road vehicles.

4. **Incorporating pedestrian and bicycle facilities when building other infrastructure (section 6.2.2)**
   a. recognising 'positive provision' policies of states and territories
   b. avoiding costly retrofitting
   c. incorporating mid- and end-of-trip facilities.

This section assesses the types of physical infrastructure that are required to encourage greater participation in walking and riding. It discusses the types of road environments that are appropriate for pedestrians and bicycle riders to ensure their safety requirements are met, and the incorporation of such infrastructure into broader transport projects.

177 Burke M & Brown A 2007, 'Distances people walk for transit', *Road and Transport Research*, 16(3) pp17–29.
178 Schneider R 2005, *Integration of Bicycles and Transit: A Synthesis of Transit Practice, Transit Cooperative Research Program Synthesis 62*, Transportation Research Board http://gulliver.trb.org/publications/tcrp/tcrp_syn_62.pdf. Accessed 19 September 2012.
179 Pucher J & Buehler R 2009, 'Integrating Bicycling and Public Transport in North America', *Journal of Public Transportation,* 12(3) pp 101–126; www.nctr.usf.edu/jpt/pdf/JPT12-3Pucher.pdf. Accessed 17 September 2012.
180 Martens K 2004, *The bicycle as a feeder mode – experience from three European countries*. Transportation Research Part D: Transport and Environment 9, no 4, pp281–294.
181 Burke M & Brown A 2007, 'Distances people walk for Transit', *Road and Transport Research,* 16(3) pp17–29.

The principal objectives of building quality transport infrastructure are to improve road safety and improve the efficiency of transport. Building appropriate infrastructure for walking and riding can support these objectives. Broadly, there are two suggested types of infrastructure treatment:

a. separation of bicycles and pedestrians from vehicular traffic, particularly on roads with large volumes of traffic and in high-speed environments
b. sharing of road space, with appropriate speed levels, in high pedestrian environments with low traffic volumes.

Different legislation, jurisdictional responsibilities and often infrastructure requirements apply to walking (which includes most wheeled mobility and recreation devices such as skateboards, roller skates and roller blades) as opposed to bicycle riding. For example, bicycles are defined as vehicles under the Australian Road Rules.[182] In some states and territories (Queensland, Tasmania, the Northern Territory and the Australian Capital Territory) bicycles are permitted to ride on footpaths unless otherwise signposted.

### 6.2.1 Recommendation 3: Creating safe environments for pedestrians and bicycle riders

Specific treatments for safe road infrastructure need to be considered on a case-by-case basis. They include separated footpaths and cycle paths; shared user paths; bicycle lanes on roads or sealed shoulders; or mixed traffic in low-speed environments.

A study by Austroads (2010) of safety and road speeds suggested three broad categories for road environments, depending on the amount of local pedestrian activity:

> *In the areas where there is a high proportion of vulnerable road users … harm minimisation speed limits should be applied and supported with appropriate infrastructure and enforcement.*
>
> *On mixed function routes … road users and traffic should be separated either in space or time. Speed limits should be adjusted towards harm minimisation … depending on the degree of this separation.*
>
> *On roads where a higher speed is required in order to maintain [motor vehicle] mobility, there should be complete physical separation between road users, such as a bypass or different transport corridors.*[183]

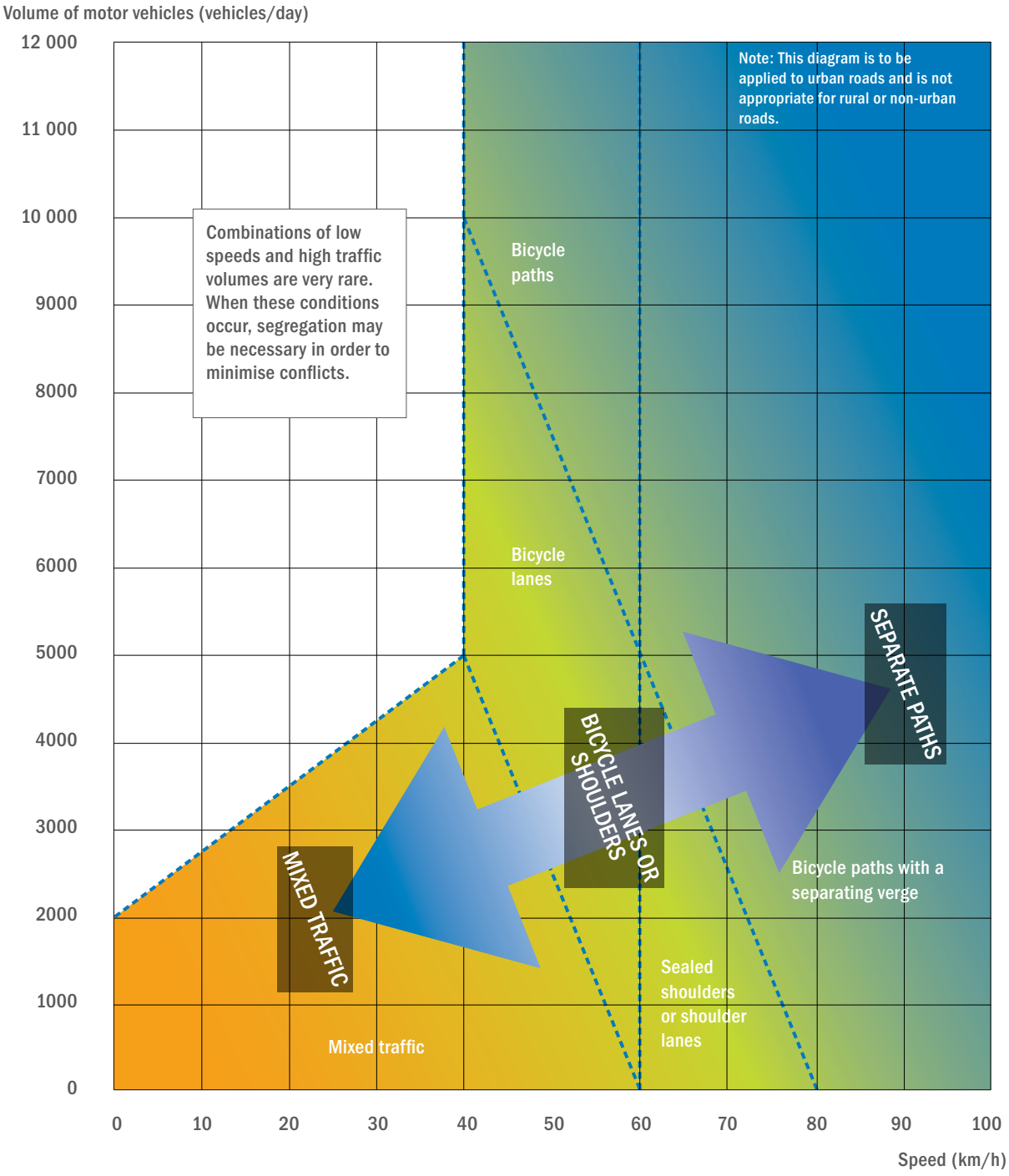
The Austroads report recommended that, in the long term, planning regulations and road standards should ensure that vulnerable road users and high-speed traffic are fully separated. Conversely, in areas of high pedestrian activity, Local Area Traffic Management solutions should be implemented and lower road speeds considered.

A simple tool for evaluating bicycle infrastructure requirements, based on daily motor vehicle traffic and posted speed limits, is presented in Figure 6.3. It shows that:

- On streets with speed limits of 40 or 50 kilometres per hour and very low traffic, bicycles are usually able to ride comfortably in mixed traffic.
- For standard 50 kilometre per hour urban streets with more than 3000 vehicles per day, or 40 kilometre per hour streets with more than 5000 vehicles per day, bicycle lanes should be installed.
- Speeds above 60 kilometres per hour with more than 5000 vehicles per day require fully separated bicycle paths. Bicycles should be separated from the main vehicle traffic by a verge or physical barrier.
- For high-speed roads (60 to 80 kilometres per hour) with low volumes of traffic, a sealed shoulder or shoulder lane should suffice.

182 *Australian Road Rules* – model law (cl 2.17, 2.18), available at www.ntc.gov.au/ViewPage.aspx?documentid=00794. Accessed 17 September 2012.
183 Austroads 2010, *Infrastructure / Speed Limit Relationship in Relation to Road Safety Outcomes*, p57.

Figure 6.3 Recommended separation of bicycles from motor vehicles, by traffic volume and speed




Source: Austroads 2009, *Guide to Traffic Management: Part 4: Network management,* report AGTM 0409, Austroads, Sydney, NSW – Figure 4.7.

Figure 6.4 illustrates different types of off-road infrastructure. More detailed guidance on particular types of on-road and off-road bicycle facilities can be found in Austroads 2008, *Guide to Traffic Management – Part 5: Road Management.*

Figure 6.4 Examples of fully separated infrastructure

**Off-road paths** that **separate** bicycles and pedestrians in areas of high pedestrian and bicycle traffic, high vehicle traffic, and high vehicle speeds

**Off-road paths** connecting suburbs with urban freeways

**Physically separated** on road paths in areas of medium to high vehicle traffic volumes and medium vehicle speeds


**Shared use paths** in areas with low volumes of pedestrians or bicycles

The *National Road Safety Strategy 2011–2020* recommends that, in metropolitan areas in particular, more speed limits of 40 kilometres per hour or lower should be established. It recommends the development of new risk-based national speed limit guidelines for different road categories or functions: 'Guidelines should encourage consistent limits based on measured risk/crash rates, while minimising multiple speed zones over short distances'.[184] The National Transport Commission is currently undertaking work in this area.

Examples of shared traffic zones and traffic calming measures are illustrated in Figure 6.5.

184 *National Road Safety Strategy 2011–2020*

Figure 6.5 Examples of shared traffic zones and traffic calming

**Mixed traffic zones** in areas of high activity and speed environments of under 30km/h

Raised pedestrian crossing on a shopping street intersection

## Road user hierarchy

The preceding sections discussed adapting road speeds and the design of infrastructure. Such an approach could culminate in an overall road hierarchy which clarifies that different roads should be designed and operated to give different road users priority. An example of one such approach is outlined below in the Victorian case study on the VicRoads SmartRoads strategy. It shows a way to prioritise and encourage alternative modes of travel at different locations and times of day to maximise the efficiency of the road and transport network. In the United States, 26 states and 330 regional and local jurisdictions have adopted or committed to a 'Complete Streets' policy which recognises the needs of all the different road users.

## Case study: SmartRoads – a new road user hierarchy for Victoria's activity centres

The Victorian Government is rethinking its road user hierarchy through the VicRoads *SmartRoads – Connecting Communities* initiative.[185]

SmartRoads provides a long-term approach for operating Victoria's road network to make it more efficient and safe, and to support the development of activity centres as places where people live and work.

By giving priority to different modes of transport at particular times of the day, SmartRoads maximises the movement of people and goods on the road system and not just that of private vehicles.

A key objective is to reduce the level of 'through' traffic and promote access to centres using a range of transport modes. This will be achieved by designating and promoting certain arterial roads as the preferred routes for traffic, allowing priority and space to be made available on other roads for trams, buses, pedestrians and bicycles.[186]

Network Operating Plans have been developed for each of the 31 local government areas across Melbourne. Plans are also being developed for other towns and cities across Victoria.

In the Complete Streets model 'all users are considered at the outset of every transportation project'.[187] Different road users are given priority consideration for different road speed environments to maximise the movement of people and freight throughout the transport system, as well as ensuring safety and convenience.

Building on the example from VicRoads in Victoria, the following model could be considered.

### Motorways and national highway network

On motorways and the national highway network, high-speed environments are necessary for the efficient movement of freight and people over long distances. The National Land Freight Strategy discussion paper identifies that one of the major problems for freight is 'the inability to use the most productive freight vehicles on transport infrastructure'.[188] Priority could be given to freight and public transport on national highway and motorway networks.

It is often not appropriate for pedestrians and bicycle riders to be in contact with these high-speed, high-traffic environments. Local communities surrounding these major roads can be connected on a separate network that includes footbridges and pathways for walking and riding.

185 Vicroads 2011, *SmartRoads: Connecting communities,* available from www.vicroads.vic.gov.au/Home/TrafficAndRoadConditions/HowWeManageTraffic/Smartroads. Accessed 17 September 2012.

186 Vicroads 2011, *Smart roads, Connecting communities,* Government of Victoria, Melbourne, available from www.vicroads.vic.gov.au/NR/rdonlyres/50B9F317-4FC2-4039-8338-A24F500CA49F/0/SmartRoadsConnectingCommunities.pdf. Accessed 17 September 2012.

187 National Complete Streets Coalition 2010, *Complete streets atlas and policies,* available from www.completestreets.org/complete-streets-fundamentals/complete-streets-atlas. Accessed 17 September 2012.

188 Infrastructure Australia 2011, *National land freight strategy discussion paper,* available from www.infrastructureaustralia.gov.au/publications/files/NLFS_220211.pdf. Accessed 17 September 2012.

### Arterial roads

Arterial roads are designed to move goods and people across cities and towns in an efficient way. Due to the volume and speed of traffic, it is appropriate for such corridors to maximise the efficient movement of goods and people and to secure safety for all road users by separating pedestrians and bicycles from motorised vehicles. Bicycles and pedestrians can be accommodated on a separate network that may run parallel to such road corridors or on adjacent footpaths. Cross walks and traffic light signal phasing can help bicycles and pedestrians to cross these roads.

### Urban roads

The majority of urban roads are designed for local trips within suburbs or neighbourhoods. The default urban speed limit on these types of roads is 50 kilometres per hour. In high-traffic environments it may be necessary to provide physical separation for bicycle and pedestrians by creating a kerb between the road and footpath or creating a wide gap between the bicycle and car lane. In low-speed, low-volume environments, on-road bicycle lanes are usually sufficient.

### High pedestrian activity areas


There are many urban locations with a high level of pedestrian activity – for example, around entertainment and shopping districts, schools, universities, hospitals and public transport interchanges. In these situations reducing traffic speeds may be the most appropriate course of action.

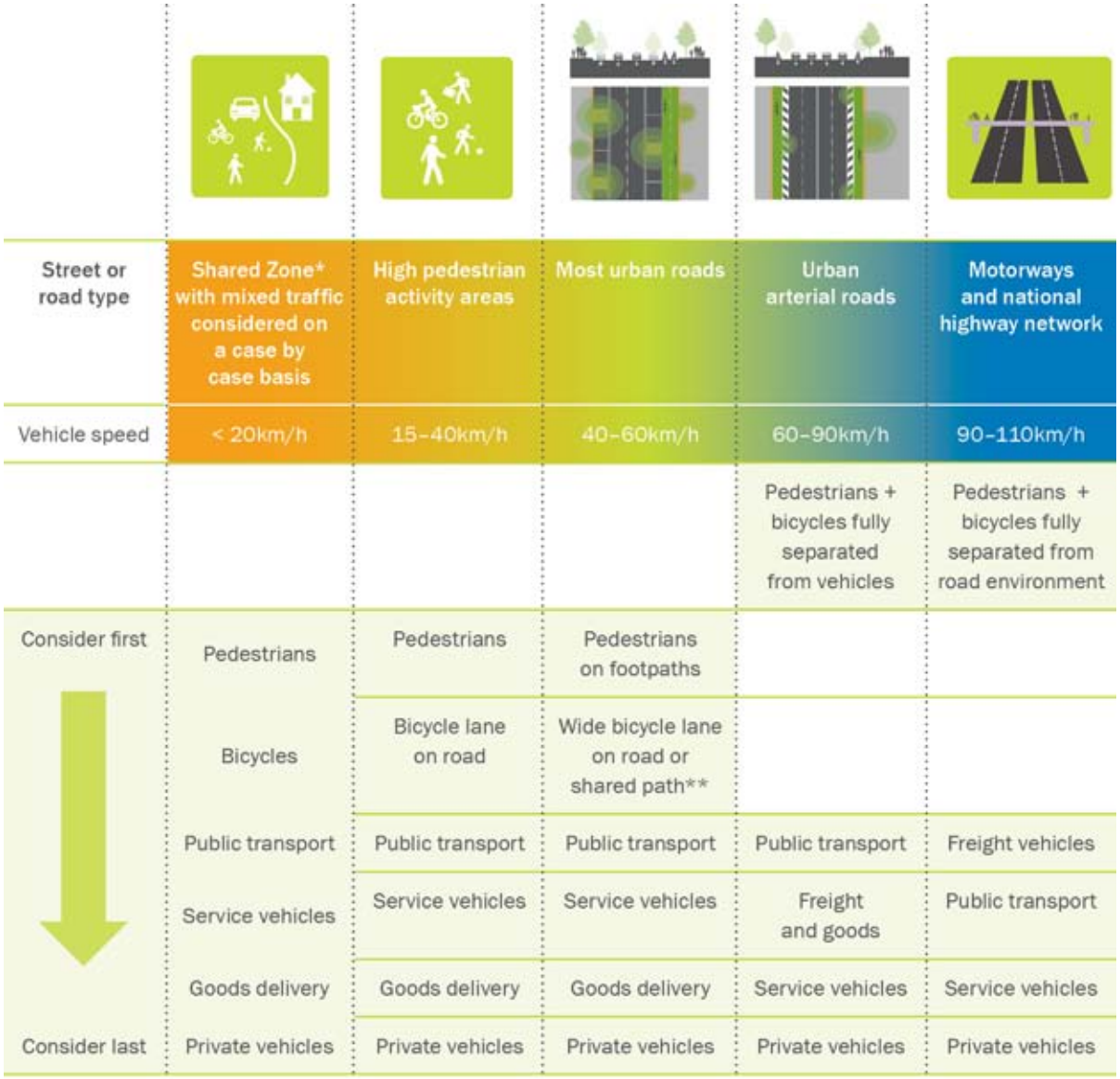
It is also appropriate to identify priority routes for through-traffic to avoid such areas. Priority could then be given to local traffic, pedestrians and bicycle riders to allow the maximum efficiency of movement of people in these areas.

### Shared zones with mixed traffic considered on a case-by-case basis

In some local circumstances it may make sense to consider creating very low speed roads that are shared by all road users. Such environments work best in areas of high activity where there is little through-traffic. There are many examples of this in European cities and there is a small but growing number in Australia.


Figure 6.6 provides a summary of these concepts in a potential road user hierarchy that prioritises different modes of transport depending on the purpose, volume and speed of traffic.

Figure 6.6 Potential urban road user hierarchy



| Street or road type | Shared Zone* with mixed traffic considered on a case by case basis | High pedestrian activity areas | Most urban roads | Urban arterial roads | Motorways and national highway network |
|---|---|---|---|---|---|
| Vehicle speed | < 20km/h | 15–40km/h | 40–60km/h | 60–90km/h | 90–110km/h |
| | | | | Pedestrians + bicycles fully separated from vehicles | Pedestrians + bicycles fully separated from road environment |
| Consider first | Pedestrians | Pedestrians | Pedestrians on footpaths | | |
| | Bicycles | Bicycle lane on road | Wide bicycle lane on road or shared path** | | |
| | Public transport | Public transport | Public transport | Public transport | Freight vehicles |
| | Service vehicles | Service vehicles | Service vehicles | Freight and goods | Public transport |
| | Goods delivery | Goods delivery | Goods delivery | Service vehicles | Service vehicles |
| Consider last | Private vehicles | Private vehicles | Private vehicles | Private vehicles | Private vehicles |

Source: Compiled from multiple sources including Austroads 2010, *Infrastructure / Speed Limit Relationship in Relation to Road Safety Outcomes* and Austroads 2009, *Guide to Traffic Management: Part 4: Network Management.*

## 6.2.2 Recommendation 4: Incorporating pedestrian and bicycle facilities when building other infrastructure

### Recognising positive provision policies of states and territories

A number of states and territories, including New South Wales, Victoria, Queensland, Western Australia, South Australia and the Australian Capital Territory, have 'positive provision' or 'favourable funding' policies in place that require walking and riding infrastructure to be considered with any road infrastructure project. Queensland has recently expanded this to also include rail and public transport projects (see case study below).

National funding agreements for infrastructure generally require projects to be built to Austroads specifications. If the project scope excludes provision for appropriate bicycling and pedestrian infrastructure, it may not meet Austroads guidelines such as Austroads (2009) *Guide to Traffic Management – Part 4: Network Management and Austroads (2009) Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths.*

Recognising the positive provision policies of state and territory governments could establish an appropriate framework for the Infrastructure and Transport portfolio to work with other levels of government.

### Case study: Queensland's favourable funding policy

Queensland's cycling program operates throughout all areas of the Transport and Main Roads portfolio. The Department of Transport and Main Roads is committed to optimising the safety, efficiency and reliability of the transport network by progressively developing a cycling network and facilities across transport assets in Queensland:

1. All planning, design, construction, maintenance and operation of state-controlled transport corridors should be undertaken on the basis that bicycle riders will use the network, both along the corridors and for access to and from public transport stops and stations.
2. Cycling network infrastructure and end-of-trip facilities should be integrated as part of planning for transport (road, rail, bus and pathway), project development and the protection of transport corridors.
3. Projects to supply and implement cycling infrastructure should be identified within the scope of delivery, including instances where the cycling network is more appropriately applied on an alternative alignment.

## Incorporating mid- and end-of-trip facilities

*Creating Places for People – an urban design protocol for Australian cities*[189] reinforces that creating a comfortable and welcoming environment is important for encouraging more people to walk or ride. Considerations include personal safety; the ability to navigate within or between locations; the provision of seating, shade, water and toilets; and bicycle parking facilities.

This can be achieved by providing mid- and end-of-trip facilities such as:

- lighting and wayfinding – maps and directional signage
- personal amenities – toilets, shade, seating and drinking fountains
- bicycle storage – bicycle racks, lockers and storage enclosures
- bicycle end-of-trip amenities – showers and change rooms
- real-time information such as bus, tram, train and ferry arrival times.

Section 5.3 of this paper discussed the barriers and opportunities for improving personal safety, comfort and convenience for pedestrians and bicycle riders. Austroads 2009, *Guide to Traffic Management – Part 7: Traffic Impacts in Activity Centres* provides guiding principles and criteria for bicycling plans, which could also be adapted for walking plans.

189 *Creating Places for People* is a collaborative commitment to best practice urban design in Australia. The protocol is the result of two years of collaboration between peak community and industry organisations, states, territories, local governments and the Australian Government. See www.urbandesign.gov.au

## Investing for active transport

There are opportunities for projects funded by Australian governments (including through the Nation Building 2 program) to facilitate further improvements to the efficiency of our urban transport systems by including priorities for incorporating walking and riding infrastructure, and improving access to public transport.

It is suggested priorities be based on (i) retaining existing connections; (ii) supporting state, territory, regional and local policies and plans for bicycle networks and pedestrian access; and (iii) building appropriate infrastructure for the speed and volume of traffic, in line with guidelines provided by Austroads.

### i) Retaining existing connections

- projects retain connections on existing local pedestrian and bicycle networks unless a reasonable alternative route is provided
- projects do not pose a significant adverse safety risk for non-motorised and motorised traffic.

Where a large transport or infrastructure corridor traverses through an urban area, or cuts off communities from one another, it can negatively impact on their prosperity and liveability – for example, reduced trade for shops, increased crime or less ability to walk or ride between neighbourhoods. If a proposed corridor cuts through an existing connection to a community, the project should be designed to preserve or reinstate this connection while not posing a significant risk to safety.

The concept of 'no route severance' is based on a policy set by the US Department of Transportation in 2010 (see section 2.2.1 of this paper). Its *Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations*[190] states that, in order to support the development of fully integrated active transportation networks, well-connected walking and bicycling networks should be considered as part of federal-aid project developments.

It includes *Prohibition of Route Severance*, under which the Secretary of Transportation has authority to withhold approval for projects that would negatively impact pedestrians and bicycle riders: 'The Secretary shall not approve any project … that will result in the severance of an existing major route or have significant adverse impact on the safety for non-motorized transportation traffic and light motorcycles, unless such project … provides for a reasonable alternate route or such a route exists.'[191]

### ii) Supporting state, territory, regional and local plans

- projects support positive provision policies of states and territories
- projects facilitate planned walking and riding routes on state, territory, regional and local plans where practicable
- public transport projects include appropriate facilities for pedestrians and bicycle riders to provide safe, convenient and efficient access to stops and stations.

Recognising the positive provision policies already in place in some states and territories, including New South Wales, Victoria, Western Australia, South Australia, Australian Capital Territory and Queensland, could establish an appropriate framework for the Infrastructure and Transport portfolio to work with other levels of government when providing infrastructure funding. It would require clear criteria, based on Austroads guidelines, for the types of walking and riding infrastructure that could be incorporated.

190 www.fhwa.dot.gov/environment/bikeped/policy_accom.htm. Accessed 17 September 2012.
191 www.fhwa.dot.gov/environment/bikeped/policy_accom.htm 23 USC 109(m). Accessed 17 September 2012.

iii) **Building appropriate infrastructure for the speed and volume of traffic**

- Follow Austroads road engineering guidelines to:
- allow separation of bicycles and pedestrians from vehicles in corridors of medium to high speed and/or large traffic volumes
- consider lower-speed environments and shared road space on a case-by-case basis for local streets with high pedestrian activity.

Austroads recommends that, where space permits, consideration should be given to providing separated bicycle facilities such as bicycle lanes or shared use paths. The two guiding principles are separating bicycles (and pedestrians) from motor vehicles; and providing a high level of priority for bicycles across driveways and through intersections.[192] Where physical separation is not possible, other treatments, such as Local Traffic Area Management, should be considered. Specific issues related to these treatments were discussed in section 6.2.1 of this paper.

## 6.3 Encouragement

Education, information and promotional activities have been shown to encourage changes to travel behaviour where facilities and infrastructure are in place to support walking, riding and public transport use. The best results are achieved when planning and infrastructure investments are supported by education and promotional activities:[193, 194]

> *Substantial increases in bicycling require an integrated package of many different, complementary interventions, including infrastructure provision, and pro-bicycle programs, as well as supportive land use planning and restrictions on car use.*[195]

Relevant priorities in the *National Cycling Strategy 2011–2016* include Promotion (to promote cycling as a viable and safe mode of transport), Guidance and Best Practice (to support the development of nationally consistent guidance for stakeholders to use and share best practice), Monitoring and Evaluation, and Safety (see Appendix A). These priorities could be broadened to include walking and public transport.

192 Austroads 2009, *Guide to Traffic Management – Part 4: Network Management*, section 4.6.5.

193 Australian National Audit Office 2012, *Establishment, Implementation and Administration of the Infrastructure Employment Projects Stream of the Jobs Fund,* pp22–23. www.anao.gov.au/Publications/Audit-Reports/2011-2012/Bike-Paths-Component-of-the-Local-Jobs-Stream-of-the-Jobs-Fund. Accessed 17 September 2012.

194 Victorian Auditor-General 2011, *Developing Cycling as a Safe and Appealing Mode of Transport – an audit of the 2009 Victorian Cycling Strategy,* August 2011.

195 Pucher J, Garrard J & Greaves S 2011, 'Cycling down under: a comparative analysis of bicycling trends and policies in Sydney and Melbourne', *Journal of Transport Geography,* 19 p344.

**ENCOURAGEMENT: To encourage greater participation in walking, riding and public transport**

5. **Leveraging infrastructure investment (section 6.3.1)**
   a. considering programs and incentives to encourage greater participation in walking, riding and public transport
   b. improving awareness and skills in the broader population.

6. **Providing consistent standards and guidelines, monitoring and evaluation (section 6.3.2)**
   a. supporting nationally consistent guidance and sharing of best practice
   b. improving monitoring and evaluation
   c. developing nationally consistent decision-making processes.

## 6.3.1 Recommendation 5: Leveraging infrastructure investment

A number of relevant programs are supported by Australian Governments: TravelSmart programs, administered by the states and territories, encourage travel behaviour change in targeted workplaces, schools and neighbourhoods (see Appendix D – TravelSmart programs). A recent evaluation of the TravelSmart Workplace program in Perth showed a benefit–cost ratio of 4.5:1 and a reduction in solo car travel by 4.3 per cent.[196]

Likewise, where the TravelSmart Household program was introduced around selected railway station catchments for the new Perth to Mandurah railway line in 2007–08, public transport patronage increased by an extra 50 per cent (measured against a control group) and car use declined by 4 per cent, at a cost of less than 0.5 per cent of the capital works.[197] This demonstrates the significant value of leveraging travel behaviour change programs when delivering new transport infrastructure.

Keys2Drive, administered by the Department of Infrastructure and Transport, provides free lessons to learner drivers across Australia, including driver awareness about vulnerable road users and responsible driving.

The Principal Pedestrian Network Demonstration Project in Melbourne and Geelong was recently cofunded by the Liveable Cities program. It combines a variety of measures at four key locations, including infrastructure as well as travel behaviour change activities.

As part of the National Partnership Agreement on Preventive Health, Healthy Communities Initiative, six organisations have been selected and funded to deliver a variety of community-based healthy lifestyle programs until June 2013. Two of the funded programs – AustCycle (Cycling Australia) and Heart Foundation Walking (National Heart Foundation of Australia) – encourage participation in cycling and walking respectively.

As described in Chapter 4.5, non-government organisations throughout Australia are also working to coordinate education and promotion activities to encourage safe walking and bicycle riding. Walk to Work Day and Walk Safely to School Day are national community events (targeting adults and children respectively) to raise awareness of the health benefits of active transport and to encourage participation in local communities, schools and workplaces.

196 Marsden Jacob Associates, 2011, *Evaluation of the TravelSmart Local Government and Workplace Program* for WA Department of Transport.
197 WA Department of Transport 2011, *Integrating TravelSmart (Demand Management) with Public Transport System Investments*, unpublished draft discussion paper.

Others are targeting the provision of adequate facilities in buildings. The Green Building Council of Australia's Green Star rating tools, for example, award additional credits to commercial, educational and multi-residential buildings that incorporate quality bicycle facilities including bicycle parking, change and shower facilities, and secure lockers.[198]

Consideration could also be given to incentives and disincentives that influence people's choices, such as pricing, taxation and rebates. As noted in Chapter 5.4, the United Kingdom has a tax exemption for employers that loan bicycles and safety equipment to employees as a tax-free benefit.[199]

Both Australian and international experience has consistently shown that participation rates in walking and riding can be accelerated when a range of complementary policies and programs are implemented together. Education and skills training, targeted travel behaviour change programs, social marketing and promotion are all part of a broader package that should be considered in conjunction with improved infrastructure and facilities.

### 6.3.2 Recommendation 6: Providing consistent standards and guidelines, monitoring and evaluation

The *National Road Safety Strategy 2011–2020* acknowledges that 'Road safety has close links with policies on transport, infrastructure, police, health, education, emergency services, energy, environment, employment, youth, research, innovation and technology, justice, insurance, trade and foreign affairs, among others'.[200]

All three levels of government are responsible for upholding the strategy:

**The Australian Government** is responsible for allocating agreed infrastructure resources, including for safety, across the national highway and local road networks, and for regulating safety standards for new vehicles.

**State and territory governments** are responsible for the funding, planning, design and operation of the road network, managing vehicle registration and driver licensing systems, and enforcing road user responsibilities.

**Local governments** are responsible for funding, planning, design and operation of the road networks in their local areas. [201]

Austroads is responsible for setting standards and providing guidelines on road-related infrastructure, including walking and bicycle infrastructure. It provides guidance on a wide range of issues related to network planning and infrastructure, including the necessity of state and territory strategies to set a direction and provide a framework for agencies to plan and integrate with local strategic bicycle plans;[202] what constitutes a bicycle network plan;[203] categories of bicycle riders and their network requirements;[204, 205] traffic management in activity centres;[206] and detailed technical guidance on types of infrastructure treatments.[207]

198 Green Building Council of Australia, www.gbca.org.au/news/gbca-news/spotlight-green-star-cyclist-facilities-credit/33736.htm accessed July 2012.
199 Department for Transport, UK 2011, *Cycle to work scheme – Implementation guidance*, UK Government, London, available from www.dft.gov.uk/publications/cycle-to-work-scheme-guidance
200 Australian Government 2011, *National Road Safety Strategy 2011–2020*, p98.
201 *Ibid.*
202 Austroads 2009, *Guide to Traffic Management – Part 4: Network Management.*
203 *Ibid.,* section 4.6.
204 *Ibid.,* section 4.6.2.
205 Austroads 2010, *Guide to Road Design – Part 3: Geometric Design and Part 6A: Pedestrian and Cyclist Paths.*
206 Austroads 2009, *Guide to Traffic Management – Part 7: Traffic Impacts in Activity Centres.*
207 Various, including Austroads 2009, *Guide to Road Design – Part 6A: Pedestrian and Cyclist Paths.*

At a national level, a number of road safety related issues are currently under review, with the aim of better integrating road safety, vehicle and transport efficiency. The National Transport Commission in particular is reviewing a range of areas affecting transport efficiency and safety, including a review of the model Australian Road Rules and Vehicles Standards Rules.[208]

The Australian Bicycle Council regularly commissions specific research and guidance on a variety of relevant topics ranging from economic value of active transport to rider safety and the provision of suitable facilities. The Australian Bicycle Council Secretariat maintains the Cycling Resource Centre website (www.cyclingresourcecentre.org.au) which is updated regularly with Australian and international literature related to cycling. Consideration could be given to how this is broadened to include walking and active travel, including non-infrastructure related issues such as encouraging travel behaviour change.

In addition, governments should ensure that climate change considerations are appropriately factored into the construction and management of infrastructure to ensure that its economic value is preserved and disruption is minimised, especially during extreme weather events.[209] This includes building infrastructure that is appropriate to a changing climate – this is expected to involve an increased frequency and intensity of heatwaves, particularly in south-eastern Australia; coastal inundation; and extreme storm events.

208 National Transport Commission 2011, *Review of the Australian Road Rules and Vehicle Standards Rules discussion paper* (www.ntc.gov.au/viewpage.aspx?documentid=2029). Accessed 19 September 2012.

209 Australian Government 2010, *Adapting to Climate Change in Australia—An Australian Government Position Paper,* www.climatechange.gov.au/en/publications/adaptation/position-paper/adapting-to-climate-change-paper.aspx. Accessed 19 September 2012.

# PART THREE

## APPENDICES

# APPENDIX A
# National Cycling Strategy 2011–2016

The *National Cycling Strategy 2011–2016* sets a target of doubling the number of people regularly riding bicycles. It is signed by the Commonwealth, state and territory ministers responsible for roads and transport. The strategy is underpinned by six priorities, as outlined below.

| Priority | Objective | Action areas |
|---|---|---|
| **Cycling promotion** | Promote cycling as a viable and safe mode of transport, and an enjoyable recreational activity | 1. Encourage short personal trips<br>2. Encourage cycling as a recreational activity<br>3. Work with employers to develop bicycle-friendly workplace facilities |
| **Infrastructure + facilities** | Create a comprehensive and continuous network of safe and attractive routes to cycle and end-of-trip facilities | 1. Invest in developing local on-road and off-road cycling networks to key destinations, that are consistent with national standards<br>2. Develop end-of-trip facilities<br>3. Austroads guidelines to recognise and promote best-practice design for infrastructure and facilities |
| **Integrated planning** | Consider and address cycling needs in all relevant transport and land use planning activities | 1. Develop and publish state and territory cycling action plans, including targets consistent with the national target<br>2. Local governments will take into account the state and territory plans, as well as community aspirations and priorities<br>3. All governments will take into account active transport needs in their land use planning and infrastructure strategies |
| **Safety** | Enable people to cycle safely | 1. Monitor and report on crashes involving bicycles<br>2. Identify countermeasures for bicycle crashes<br>3. Assess the cause of crashes and injuries and make recommendations about how to increase safety<br>4. Develop and implement programs to target road safety and perception of safety<br>5. Roll out nationally consistent skills training<br>6. Support the delivery of cycling proficiency and road safety training for 10–14-year-olds |

| Priority | Objective | Action areas |
|---|---|---|
| **Monitoring + evaluation** | Improve monitoring and evaluation of cycling programs and develop a national decision-making process for investment in cycling | 1. Agree a baseline and target for measuring progress against the national goal of doubling cycling participation<br>2. Develop and implement a nationwide approach to data collection and report annually to the Secretariat<br>3. Develop an agreed decision-making process for assessing the costs and benefits of investment in cycling |
| **Guidance + best practice** | Support the development of nationally consistent guidance for stakeholders to use and share best practice across jurisdictions | 1. Publish nationally consistent guidance on a range of issues<br>2. Support local governments with guidance and best practice<br>3. Monitor cycling policy issues and identify areas which require further guidance<br>4. Provide web-based best-practice case studies |

APPENDIX B

# Recent national infrastructure projects that incorporate walking and riding

## Nation Building Program

The Nation Building Program assists national and regional economic and social development by the provision of funding aimed at improving the performance of land transport infrastructure. The Department of Infrastructure and Transport is delivering this investment through a range of road and rail programs and projects across the National Land Transport Network. The network is based on national and inter-regional land transport corridors that are of critical importance to national and regional growth.

A number of bicycle infrastructure components have been funded since 2008 as part of larger transport projects. These are outlined in the table below.

### Bicycle infrastructure components of road and rail projects in the Nation Building Program

| Location | Project | Bicycle infrastructure component |
|---|---|---|
| NSW | Banora Point deviation, Pacific Highway | 5.5-kilometre cycleway |
| | Great Western Highway | 4.3-kilometre cycleway |
| | Great Western Highway, Wentworth Falls | 2.3-kilometre cycleway |
| VIC | Princes Highway East, Traralgon to Sale | 3-kilometre cycleway |
| | Geelong Ring Road stage 4A | 1.9-kilometre cycleway |
| | Geelong Ring Road stage 4B, Anglesea to Princes Highway | 1.2-kilometre cycleway |
| | Clyde Road upgrade | 2-kilometre cycleway |
| QLD | Mains Road and Kessels Road upgrade | 2-kilometre walking path and on-road bike path |
| | Morton Bay rail link (associated road works) | Various walking paths and on-road bike paths |
| WA | Kwinana Freeway, widening and upgrade | 32-kilometre cycleway |
| | Great Eastern / Roe Highway Interchange | 3-kilometre cycleway |
| SA | Northern Expressway | 23-kilometre cycleway |
| TAS | Kingston Bypass | 2.5-kilometre cycleway |
| | Brighton Bypass | 2.4-kilometre cycleway |
| | Bridgewater Bridge / Lyell Junction project | 0.3 kilometre cycleway |

## Jobs Fund Bike Paths Program

The Jobs Fund was a component of the Australian Government's economic stimulus package which included a grants program for bike paths between 1 July 2009 and 30 June 2011. It gave $37.9 million in grants and leveraged $80 million in spending for 167 projects across Australia.[210]

The aim of the program was to support and create jobs and employment opportunities in communities affected by the global recession. An audit by the Australian National Audit Office (ANAO) showed that there are some lessons to be learned from the program. Whilst the program provided many good local projects, the ANAO stated that it represented a 'missed opportunity to maximise the contribution the [program] could make towards achieving the objectives of the National Cycling Strategy'.[211]

The ANAO audit recommended that any future grant programs involving the construction of cycling infrastructure should ensure that application processes and assessment criteria support the selection of projects that are likely to best contribute to achieving the objectives of the National Cycling Strategy.[212]

210 Department of Regional Australia, Local Government, Arts and Sport 2011, *List of announced National Bike Path Projects*, available from www.regional.gov.au/regional/national_bike_path.aspx. Accessed 17 September 2012.

211 Australian National Audit Office 2012, *Establishment, Implementation and Administration of the Infrastructure Employment Projects Stream of the Jobs Fund,* pp22–23, available from www.anao.gov.au/Publications/Audit-Reports/2011-2012/Bike-Paths-Component-of-the-Local-Jobs-Stream-of-the-Jobs-Fund. Accessed 17 September 2012.

212 Australian National Audit Office 2012, *Establishment, Implementation and Administration of the Infrastructure Employment Projects Stream of the Jobs Fund,* Recommendation 1.

APPENDIX C

# State and Territory walking and bicycle plans

## New South Wales


The New South Wales Government is delivering an extensive program of actions to accelerate participation in riding and walking, in line with NSW 2021 (NSW Government State Plan) targets. These targets have been incorporated into the NSW Bike Plan and forthcoming NSW Walking Strategy.

Action by the New South Wales Government includes building active transport infrastructure to give people more safe and pleasant places to walk and ride, plus supporting policies and initiatives involving different government agencies, businesses and community organisations.

NSW active transport policies and strategies are currently being reviewed as part of work, led by Transport for NSW, on developing a new Long Term Transport Master Plan for the state.

### NSW Bike Plan


**Status: Current**

The *NSW Bike Plan 2010–2020* is a 10-year plan for new bicycle infrastructure, funded through the New South Wales Government Metropolitan Transport Plan, committing $158 million to improving cycling networks across the state. The plan also describes a range of social programs and activities, including cycling skills and awareness training and more access to information for bicycle riders.

www.rta.nsw.gov.au/roadprojects/projects/bicycle_projects/documents/nsw_bike_plan.pdf

Targets include commitments to:

- increase the share of short trips by bike in Greater Sydney, for all travel purposes, to 5 per cent by 2016
- double the use of cycling to get to work, across all of NSW, between 2006 and 2016.

## Draft NSW Walking Strategy

**Status: Under development**

In 2011, the New South Wales Government released *NSW 2021*, which included a target to increase walking for short trips and a commitment to develop a NSW Walking Strategy. It is being developed by a whole-of-government steering group chaired by the Premier's Council for Active Living (see the case study below). It will complement plans for other modes of travel and help to achieve a number of *NSW 2021* targets, including increased public transport use, increased active travel and increased use of parks and recreational facilities.

### Case study: NSW Premier's Council for Active Living (PCAL)

The Premier's Council for Active Living (PCAL) (www.pcal.nsw.gov.au) is a New South Wales interagency group that aims to increase participation in physical activity, including active transport, by building supportive physical and social environments. The council comprises senior representatives from the New South Wales Government (linking infrastructure and service delivery agencies), business and the non-government sectors. It reports to the Premier of New South Wales.

PCAL is focused on achieving high-level interagency collaboration to promote physically active lifestyles.[213] Several other Australian states and territories have established similar intersectoral groups.

To improve the coordination of statewide active transport infrastructure and programs, PCAL convened an ongoing high-level Active Transport Roundtable in 2008 with representatives from health, environment, transport and planning agencies. The roundtable led to the implementation of a number of initiatives including a NSW State Plan Active Transport Target for walking and cycling; the development of interagency tools such as a NSW Workplace Travel Plan Resource; and a range of policy changes such as mandatory provision of end-of-trip facilities within New South Wales Government workplace refurbishments.[214]

PCAL was also requested to oversee the development and resourcing of an updated NSW Bike Plan and to inform the development of a forthcoming NSW Walking Strategy.

Cost–benefit analysis of priority walking and cycling projects is another example of work that has benefited from a coordinated interagency approach. These analyses have revealed significant positive returns from both walking and riding proposals.[215]

PCAL is currently assisting to compile interagency views as part of the preparation of a new long-term transport master plan for the state.

PCAL has also worked to facilitate interagency collaboration on urban design to promote the better active transport. Examples include working with the NSW Department of Planning and Infrastructure to prepare an Active Living Position Statement; evidence-based indicators; embedding active living/transport principles within relevant state projects; providing resources for local council planners and developers such as case studies; and providing interagency capacity building workshops.

213 Global Advocacy Council for Physical Activity, International Society for Physical Activity and Health 2010, *The Toronto Charter for Physical Activity: A Global Call to Action,* 20 May 2010, www.globalpa.org.uk

214 McCue P 2010, 'NSW Premier's Council for Active Living (PCAL)', *NSW Public Health Bulletin*, 21(5–6).

215 PWC 2010, *Estimating the benefits of walking a cost benefit methodology*, www.pcal.nsw.gov.au/draft_nsw_walking_strategy

# Victoria

## Victorian Cycling Strategy

**Status: Under review**

The *Victorian Cycling Strategy* set out a number of priority actions aimed at establishing cycling as a viable, sustainable, affordable and safe transport option. Priority actions in the strategy included:

- significantly improving the cycling network within 10 kilometres of the CBD
- establishing a public bike hire scheme for Melbourne
- installation of bike cages at 33 train stations
- completing cycling networks in central activities districts and regional centres
- providing bicycle facilities as part of transport projects
- developing safe cycling programs in Victorian schools
- launching a 'look out for cyclists' campaign to educate other road users about cyclist safety
- a review of cycling accident patterns to develop appropriate countermeasures.

The current strategy is under review.

## Pedestrian Access Strategy


**Status: Current**

The *Pedestrian Access Strategy* was developed in 2010. Its aim is to encourage more Victorians to walk, especially for short trips.

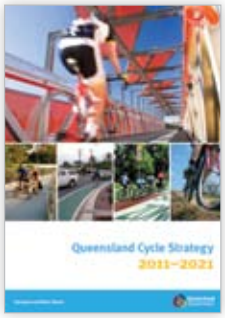
The strategy establishes broad policy principles and the first steps to guide investment in walking – including infrastructure, planning and design, safety and behaviour change programs.

Policy directions include:

- encouraging people to walk by changing attitudes and behaviour
- collaborating to improve provision for walking
- creating pedestrian-friendly built environments, streets and public spaces
- increasing the safety of walking
- integrating walking with public transport.

# Queensland

## Queensland Cycle Strategy




**Status: Current**

The *Queensland Cycle Strategy 2011–2021* has a vision of 'more cycling, more often' on safe, direct and connected routes. It aims to increase the number of trips made by bicycle and advance a vibrant culture of cycling in Queensland.

It has four priority areas for action:

- building safe, direct and connected cycle networks
- growing a cycling culture
- creating cycle-friendly communities
- developing a cycling economy.

Each priority area is supported by a set of actions designed to help achieve the strategy vision and targets. These actions have short-, medium- or long-term timeframes for implementation or are existing and will be continued. It also sets out a signature project for each priority.

## Action Plan for Walking 2008–2010


**Status: Now included in Regional Integrated Transport Plans**

The *Queensland Action Plan for Walking 2008–2010* was designed to encourage walking; make walking accessible and sustainable within communities; facilitate the development of safe and convenient pedestrian networks that encourage people to walk; and address road and individual safety concerns.

The action plan set out to achieve a vision for Queensland where people from all sectors of the community are able to choose to walk for transport and enjoyment. This in turn will help to create a healthier population, connected communities and an integrated, affordable and sustainable transport system.

# Western Australia

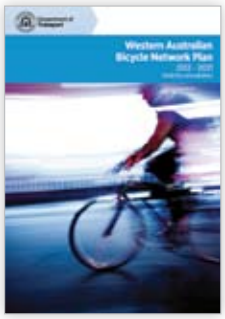
Western Australia has a higher participation rate in cycling than the national average.[216] It continues to register strong growth in cycling participation, with Perth registering an increase of 8.8 per cent in the second quarter of 2012 compared with the same period in 2011.[217]

*Active Living for All: a framework for physical activity in WA 2012–2016* sets a vision for Western Australia to be the most active state in Australia. It has outcome areas for 'active places', to create well planned and designed environments that support, encourage and enable active living; and 'active people', to promote positive behaviour change and opportunities to participate in active lifestyles. Indicators include the proportion of people undertaking walking or riding trips, and active commuting to local destinations.

216 Australian Bicycle Council 2011, *National Cycling Participation Survey.*
217 WA Department of Transport 2012.

## Draft WA Bicycle Network Plan

**Status: Draft update underway**




The draft *Western Australia Bicycle Network Plan 2012–2021* will update the 1996 *Perth Bicycle Network Plan* and add regional cycling. The plan will map out the next 10 years for servicing Western Australia's expanding cycling needs, particularly those of riders commuting to work.

Key recommendations include:

- expansion of the Principal Shared Path network
- a connections to schools program
- a connections to rail / major bus stations program
- review of traffic management on local roads
- review of local bicycle routes
- development of an online journey planner
- planning for cycling facilities in larger regional cities
- funding increases to grants programs
- a feasibility study for an end-of-trip facility in the CBD
- biennial review.

## Walk WA

**Status: Current**


*Walk WA: A Walking Strategy for Western Australia* (2007–2020) was a collaborative effort between state and local government agencies and community groups. Its vision by 2020 is to create a vibrant, safe, accessible place with a supportive walking environment where all West Australians enjoy walking for health, recreation or transport.

It has five key objectives:

- to provide advocacy and leadership; and improve coordination and inclusiveness
- to promote walking
- to improve the places where people walk
- to improve safety and security
- to implement and expand programs and services that provide opportunities for walking.

The walking strategy has links to other Western Australian Planning Commission strategies such as *Network City: Community Planning Strategy for Perth and Peel* (2004), *Liveable Neighbourhoods Policy* and Crime Prevention Through Environmental Design.

# South Australia

**Status: Under review**

*Safety in Numbers* was a strategy to increase the safety, convenience and attractiveness of cycling as a priority when actions and decisions are being made in areas such as transport, planning, health, recreation and tourism. The strategy had the following objectives:

- effective planning and coordination for cycling
- comprehensive cycling networks and facilities
- safer cycling
- successful promotion of cycling
- government leading by example.

## Case study: Towards Zero Together – South Australia's road safety strategy 2020

In 2010 the South Australian Government commissioned thinker-in-residence Professor Fred Wegman to suggest strategies for reducing the number of deaths and serious injuries on the state's roads. His interim report, *Driving Down the Road: building a safer system* (2011) suggests the following:

- Build a traffic system with considerably lower casualty levels, if not zero, for the next generation.
- Integrate people, vehicles and roads into one Safe System.
- Address the whole network – all vehicles and road users – instead of only high-risk groups.
- Integrate road safety with other policy areas.
- Acknowledge that prevention of crashes is not wholly dependent on road user mistake or error.
- Assume all crashes are preventable, beginning with interventions that are the most effective and cost-efficient.


*Towards ZERO Together* sets a target to reduce serious casualties by at least 30 per cent by 2020.
It incorporates the *30 Year Plan for Greater Adelaide*, including a requirement that road safety criteria be explicitly included in the planning process so that safe road environments are provided for pedestrians, cyclists, light and heavy vehicles and for the ageing population.

'In urban areas provision for people walking and cycling is important and in some locations these modes should be given priority over motorised traffic when designing the road network. Infrastructure initiatives to address the particular needs of vulnerable road users will include the provision of safe and separate facilities for people walking and cycling, as well as the provision of a safe speed environment when separation is not possible. We cannot continue to define cycle lanes as a painted white line that peters out when it gets too hard. Promotion and facilitation of safe shared-use pathways for cycling and walking and safer speeds will help encourage people to move away from the dominant car culture and re-establish active transport as an attractive and healthier alternative to driving.'[218]

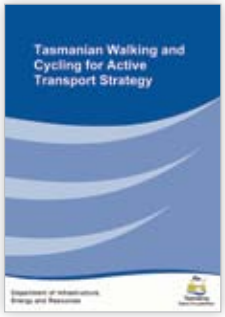
218 South Australian Government 2010, *Towards Zero Together: South Australia's road safety strategy 2020.*

# Tasmania

The *Greater Hobart Household Travel Survey 2010* indicated that many car trips in Hobart are for distances of less than three kilometres. There is potential to replace some of these car trips with more walking and bicycling.

The *National Cycling Participation Survey 2011* found that, in a typical week, 5.9 per cent of Tasmanians ride a bicycle for transport, although many of these trips are not for travel to work. Although 20 per cent of Hobart's transport-related journeys are undertaken by walking, only 1 per cent are made by cycling.

## Tasmanian Walking and Cycling for Active Transport Strategy




**Status: current**

The *Tasmanian Walking and Cycling for Active Transport Strategy* aims to support people to walk and cycle for transport by working with all tiers of government and with the community to:

- improve infrastructure and facilities to support walking and cycling for transport
- improve safety for pedestrians and cyclists
- create awareness that cycling and walking are viable everyday transport options.

# Northern Territory

The *National Cycling Participation Survey 2011* indicated that the Northern Territory has the highest proportion of cycling participation of any Australian state or territory, with 26 per cent of people riding in a typical week compared with a national average of 17.8 per cent.[219]

The percentage of people cycling for transport purposes is higher than other Australian jurisdictions, at 11 per cent mode share, and the percentage of people cycling to work is higher in Darwin than all other capital cities at 3.2 per cent.[220] Walking to work is also popular, with 5.7 per cent of people regularly walking to work in Darwin (second only to Hobart).

The *Territory 2030 Strategy* provides a high-level commitment to reducing reliance on private motor vehicles through increasing the number of Territorians cycling, walking and using public transport. There are also clear policy targets and actions to reduce car dependency and improve active transport in the *NT Climate Change Strategy,* the recently released *NT Transport Strategy* and the *Greater Darwin Plan.* Many of these policies are already being actively implemented across the Northern Territory.

The Department of Lands and Planning's TravelSmart web page brings together resources, links and information regarding active transport in the NT including cycling, walking and public transport (http://www.transport.nt.gov.au/travelsmart/about-us).

219 Australian Bicycle Council 2011, *National Cycling Participation Survey.*
220 ABS 2006, *Census of Population and Housing.*

### NT Transport Strategy


**Status: current**

The *NT Transport Strategy*, released in February 2012, provides a guiding framework for transport development in the Northern Territory and identifies seven key strategic areas. Sustainable and Active Transport is a key strategy which aims to increase active transport through a number of specific actions including encouraging walking, cycling and public transport.

### Connected and Safe


**Status: current**

*Connected and Safe,* released in 2011, provides an overview of the Northern Territory's major cycle path networks in Darwin and Alice Springs, and outlines actions for the maintenance and development of these networks.

## Australian Capital Territory

With a bicycle to work mode share of 2.5 per cent and a walk to work mode share of nearly 5 per cent,[221] the ACT has a higher proportion of 'active travel' than most other states and territories.

### Transport for Canberra


**Status: current**

*Transport for Canberra,* launched in March 2012, is the foundation for transport planning for the next 20 years. It updates and replaces the 2004 *Sustainable Transport Plan* and sits alongside the ACT Planning Strategy, launched September 2012, which updates and refreshes the *Canberra Spatial Plan.*

*Transport for Canberra* was prepared in conjunction with the *ACT Planning Strategy* to ensure that relationships between land use and transport can support a shift to more sustainable transport. It commits to the following actions for walking and bicycling:

- shared paths in town centres and major employment areas
- a master plan for a commuter bicycle network with high-quality infrastructure that is safe and well signposted, offering direct routes to destinations and integrated with public transport
- investigation of shared spaces, segregated lanes, priority at intersections, electric bikes and public cycle parking facilities in the city
- an Active Travel to School Strategy
- updated design guides and standards
- road safety awareness programs for motorists, motorcyclists, bicycle riders and pedestrians to reduce crash rates and engender a culture of sharing the road
- explore the establishment of a taskforce and whole-of-government working group to implement active travel projects and programs that support physical activity.

221 ABS Census 2006.

# APPENDIX D
# TravelSmart programs

## National overview

TravelSmart is aimed at changing driver-only car trips to more sustainable and active types of transport. It focuses on influencing travel behaviour by addressing community and organisational cultural issues and the complexity of travel decision-making processes in key settings where travel decisions are made or can be influenced. This involves working with individuals in the household setting to help them make informed travel choices about how to get to places using their cars less and walking, cycling and using public transport more. It also involves working with local communities including workplaces, hospital, universities, schools and local governments to help them self-manage the process of travel behaviour change for their staff and customers. TravelSmart was first trialled in Western Australia in the late 1990s. Since then other jurisdictions have implemented TravelSmart programs to varying extents.

Between 2002 and 2008 the Australian Government provided the overall coordination, facilitation and funding support for many TravelSmart projects. The majority of funding for a National Travel Behaviour Change Program was provided through the Greenhouse Gas Abatement Program, with minor funding provided through the Local Greenhouse Action Program.

The program showed decreases in car use of 4 per cent to 15 per cent and increases in walking, bicycle riding and public transport use. These results are consistent with findings from Europe and North America. There is also some evidence that changes can be sustained for at least five years without maintenance or further intervention.[222]

An evaluation of the Western Australian TravelSmart Workplace program in 2011 found that it reduced car use by an estimated 5.63 million kilometres annually. The program was estimated to have a benefit–cost ratio of 4.5:1, achieving net annual benefits to the community of $2.4 million.[223] An evaluation of the Perth TravelSmart Household program estimated the benefit–cost ratio to be around 30 to 1. The Brisbane North National Travel Behaviour Change Program project was estimated to have a benefit–cost ratio of 16:1.[224]

222 Australian Government Department of Environment and Heritage, Australian Greenhouse Office 2005, *Evaluation of Australian TravelSmart Projects in the ACT*, South Australia, Queensland, Victoria and Western Australia 2001–2005.

223 Marsden Jacob Associates 2011, *Evaluation of the TravelSmart Local Government and Workplace Programs,* Department of Transport Western Australia, www.transport.wa.gov.au/activetransport/24690.asp

224 Ker I 2002, *Preliminary Evaluation of the Financial Impacts and Outcomes of the TravelSmart Individualised Marketing Program – Update* WA Department of Planning and Infrastructure, Perth.

The Australian Government continues to fund some state and territory TravelSmart initiatives under the National Partnership Agreement on Preventive Health. In Western Australia, this funding supports expansion of the TravelSmart Workplace program under the Healthy Workers Initiative over 2012 to 2015. Queensland is funded under the Healthy Children's Initiative to support an expanded TravelSmart Schools program.

The success of TravelSmart has been largely dependent on the level of commitment by each state and territory. Several states continue to run these programs. Western Australia, for example, has released a 10-year plan for TravelSmart to 2020.

## New South Wales

The TravelSmart Households pilot program in NSW was held in Ermington and Woy Woy. About 5600 households were invited to participate in a program designed to encourage residents to leave the car at home.

New South Wales also assists trip generators to produce transport access guides that provide customised sustainable transport information for people travelling to and from a particular site.

The University of Newcastle developed a comprehensive transport access plan for the Central Coast Campus at Ourimbah. It is implementing improved travel information and transport services and improved parking management as well as infrastructure improvements for bicycle riders and pedestrians.

## Victoria

TravelSmart in Victoria has used the travel planning process in a range of settings and continues to develop resources and guidance to support schools, workplaces, tertiary institutions and communities in implementing effective travel plans.

### Schools

The Department of Transport has worked with over 150 schools to develop travel plans. The team continues to build on this work in partnerships with school communities, local councils and other government departments.

### Workplaces and tertiary institutions

TravelSmart Victoria has engaged with over 140 workplaces and tertiary institutions to develop travel plans. By introducing a workplace travel plan that encourages walking, cycling, public transport, carpooling and teleworking, companies of all sizes can save themselves and their employees both time and money.

### Community travel planning

Community travel plans are developed to support changes in travel behaviour across a local community. Travel plans provide an opportunity to embed sustainable transport within a community along with producing broader social engagement.

## Queensland

Queensland has TravelSmart programs in schools, workplaces, households and destinations.

The Queensland Department of Transport and Main Roads, through the TravelSmart program, was identified by Queensland Health as a strategic partner in achieving the objectives of the National Partnership Agreement on Preventive Health's Healthy Children and Healthy Workers initiatives.

The Healthy Active School Travel initiative aims to increase the physical activity levels of school-aged children through school and community events, activities and infrastructure improvements that promote active school transport and increase overall physical activity.

The TravelSmart Communities project contacted almost 300 000 households across South East Queensland and was the largest such program undertaken in the world. The project was delivered across Brisbane South, Gold Coast and Sunshine Coast.

TravelSmart Destination projects are among some of Queensland's most successful projects. Large destinations such as universities are well positioned to encourage students, staff and visitors to minimise car trips.

James Cook University in Townsville and the Queensland University of Technology's Kelvin Grove campus have been the first to take the lead in helping to reduce traffic, improve health and preserve the environment. James Cook University reduced emissions and achieved a 20 per cent reduction in car use. Queensland University of Technology achieved a 9 per cent increase in train use, and a 16 per cent increase in bus use. There has also been an 18.5 per cent increase in walking and cycling. The strategies to achieve these results included a range of promotional activities and policy initiatives.

## Western Australia

It's how you get there that counts

The WA Department of Transport has had a social marketing plan for the past decade to encourage cycling and walking with its *Cycle Instead* and *Walk There Today* messages.

An evaluation of the Western Australian TravelSmart Workplace program in 2011 found that the program has reduced work-related car use by an estimated 5.63 million kilometres annually. The program was estimated to have a benefit–cost ratio of 4.5:1, achieving net annual benefits to the community of $2.4 million.[225] Western Australia is being funded by the Australian Government to support the expansion of the TravelSmart Workplace program under the Healthy Workers Initiative from 2012 to 2015.

Since 2008, the TravelSmart Household program has been delivered as a cross-sectoral joined-up model capitalising on partnership and funding opportunities to extend program reach and efficiencies. An example is the Living Smart program (combining funding sources in the transport, environment and energy sectors) to enable households to reduce their car, energy and water use and waste. This program has been delivered to a target population of 475 000 people (approximately one-third of Perth's population), achieving estimated annual reductions in excess of 300 million vehicle kilometres travelled, together with a range of other cross-sectoral benefits.

225 Marsden Jacob Associates 2011, *Evaluation of the TravelSmart Local Government and Workplace Programs,* Department of Transport Western Australia, Perth, available from www.transport.wa.gov.au/activetransport/24690.asp

## South Australia

Between 2005 and 2008, TravelSmart SA ran a community behaviour change project in the western suburbs of Adelaide as part of the National Travel Behaviour Change Project, in a partnership with the Australian Greenhouse Office. Evaluation of the project demonstrated the following successful outcomes:[226]

- Participants reduced car travel both on weekdays and weekends.

  The average reduction in car use by participants was 10.4 kilometres per household per day, representing a very significant 18 per cent reduction. Car travel on weekends was reduced by 36 kilometres. Conversely, non-participating households showed significant increases in distance travelled over the study period of 14 kilometres on weekdays and 4.5 kilometres on weekends.

- Non-participants increased Vehicle Kilometres Travelled (VKT) while participants decreased VKT.

  The total reduction of VKT per day for all participating households was 229 850 kilometres per day, while non-participants increased VKT by 605 030 kilometres.

- Participants exceeded the greenhouse gas abatement target of the National Travel Behaviour Change Project.

  Collectively over the life of the project, participants saved a total of 86 000 000 VKT and 28 000 tonnes of greenhouse gas emissions.

- Participants learnt to make fewer trips.

  Not only did the project achieve a significant reduction in VKT but results indicate that the number of journeys travelled was also reduced. The decrease in car trips for participants over the evaluation waves was 5 per cent, while non-participants increased the number of trips made by 3.8 per cent.

- Participants learnt to travel more efficiently.

  Travel time results indicate that, from GPS waves one to three, non-participants significantly increased the amount of time they spent travelling for all days. By comparison, participants decreased travel time significantly between waves one to three on weekends, with smaller decreases on weekdays. This indicates that participants learnt to travel more efficiently than non-participants.

- Significant household savings in fuel.

  The 22 103 households made a collective fuel saving of $11.6 million (based on average fuel prices over this period of $1.20 per litre), which equated to $525 per participating household.

Following the success of the *TravelSmart Households in the West project*, the South Australian Government offers grants to local governments to run their own travel behaviour change programs. It has continued with community-scale interventions to the east of the original program in the suburbs of Cowandilla, Hilton, Marleston, Mile End, Mile End South, Richmond, Thebarton, Torrensville and West Richmond between August 2010 and June 2011.

226 South Australia Government Department for Transport, Energy and Infrastructure 2009, *TravelSmart Households in the West* evaluation, available from http://www.sa.gov.au/upload/franchise/Transport,%20travel%20and%20motoring/TravelSMART/TravelSMART_Households_in_the_West.pdf

## Tasmania

The Tasmanian Government is conducting a pilot Travel Behaviour Change program, branded Travelchoice. It is administered by the Department of Infrastructure, Energy and Resources, the state's transport agency. A range of initiatives, designed to support departmental staff in moving from 'drive and park' as a dominant travel mode to more sustainable travel modes, are being rolled out over 18 months. The program is informed by research on staff travel patterns and the barriers and enablers to change.

At the conclusion of the pilot phase, around mid-2013, the second stage of the project will develop templates, guidelines and access arrangements for rolling out successful initiatives across the State Service and the broader community.

## Northern Territory

NT TravelSmart provides tips and resources to make travel choice easier and reduce reliance on cars. The Northern Territory Government is encouraging TravelSmart choices to achieve goals under Territory 2030 and the Northern Territory Climate Change Policy.

## Australian Capital Territory

In Canberra, TravelSmart was an integral component of the ACT's former Sustainable Transport Plan. The ACT's TravelSmart program consisted of TravelSmart Workplaces and TravelSmart Households.

TravelSmart Workplaces involved developing customised Travel Plans for five workplaces to encourage staff to leave their cars at home and use healthier, more sustainable modes of transport as a means of travelling to and from work.

# APPENDIX E
# Table of Figures

## Photo credits

Chapter 1: Brisbane Marketing (Brisbane QLD)

Chapter 2: Sara Stace (Sydney NSW), Kylie Legge, Place Partners (New York USA)

Chapter 3: Wollongong City Council (Wollongong NSW), Elaena Gardner, Australian Bicycle Council (graphics), Cycling Promotion Fund (Canberra ACT)

Chapter 4: Sara Stace (Perth WA)

Chapter 5: Peter Bourke, Cycling Promotion Fund (Shepparton VIC), Stephen Hodge, Cycling Promotion Fund (Perth WA), Tom Stace (South East QLD), Sara Stace (Sydney NSW), Mark McDonald, DTMR (Brisbane QLD), Terry Leung for AustCycle (Albury NSW)

Chapter 6: Sara Stace (Brisbane QLD, Sydney NSW), Ben Cebuliak (Sydney NSW, Bendigo VIC), City of Darebin (Melbourne VIC)

# APPENDIX F
# Acronyms

| | |
|---|---|
| **ACT** | Australian Capital Territory |
| **ANAO** | Australian National Audit Office |
| **BITRE** | Bureau of Infrastructure, Transport and Regional Economics |
| **ANPHA** | Australian National Preventive Health Agency |
| **COAG** | Council of Australian Governments |
| **NSW** | New South Wales |
| **NT** | Northern Territory |
| **OECD** | Organisation for Economic Co-operation and Development |
| **PCAL** | Premier's Council for Active Living in NSW |
| **QLD** | Queensland |
| **SA** | South Australia |
| **SCOTI** | Standing Council on Transport and Infrastructure (a COAG ministerial council of Transport, Infrastructure and Planning Ministers) |
| **TISOC** | Transport and Infrastructure Senior Officials Committee (heads and deputy heads of transport, infrastructure and planning departments) which reports to SCOTI |
| **TAS** | Tasmania |
| **VIC** | Victoria |
| **WA** | Western Australia |

# APPENDIX G
# References

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