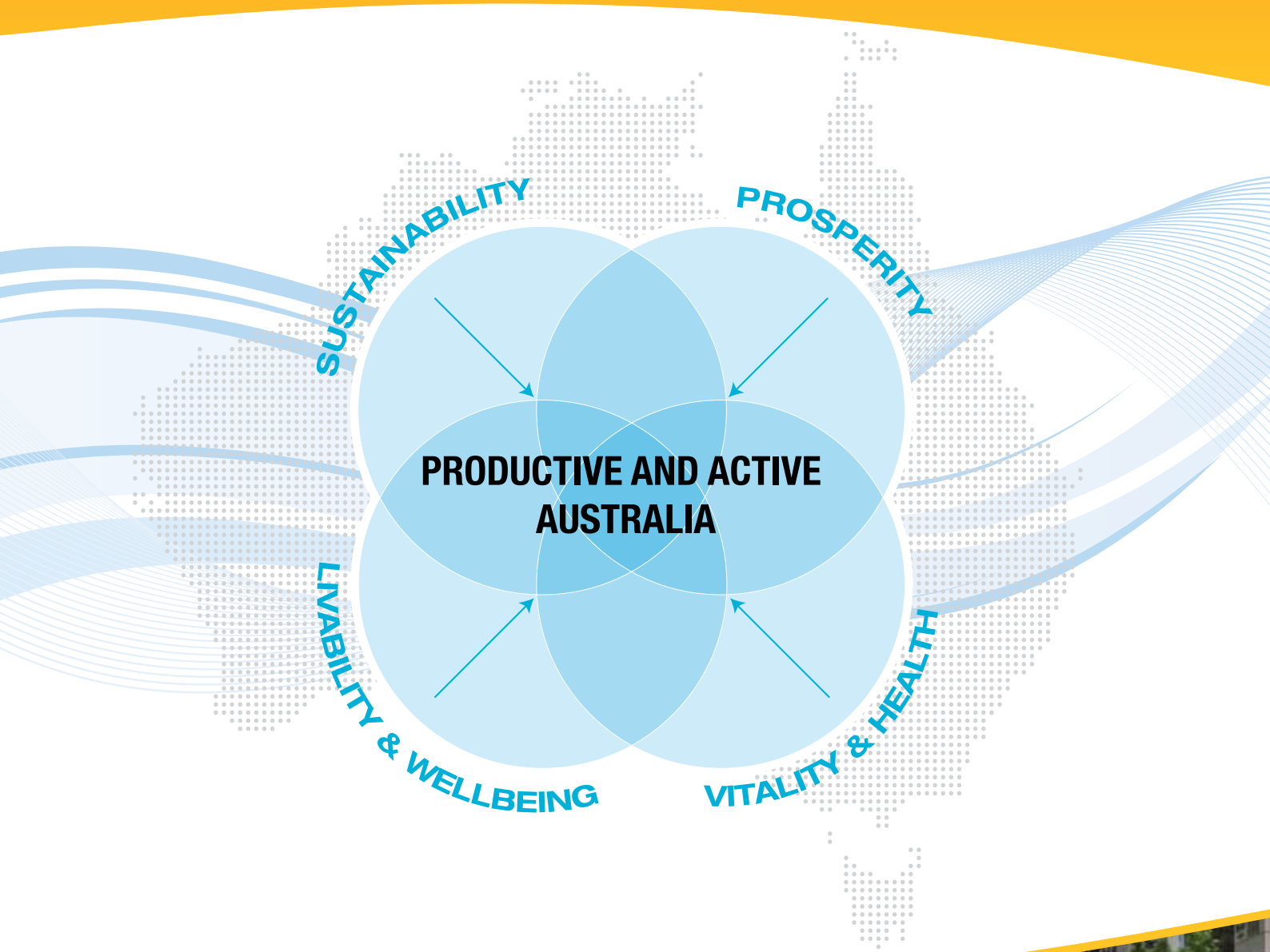


# ***MOVING AUSTRALIA 2030***

➤ *A TRANSPORT PLAN FOR A  
PRODUCTIVE AND ACTIVE AUSTRALIA*



## Our vision for moving people in Australia by 2030 is:

- > An integrated and multi-modal transport system that will safely and efficiently move Australians and our goods.
- > A high quality of life for all Australians from continuing improvements in the sustainability and liveability of our cities and regions through:
  - the development of world class public transport systems and improved freight networks
  - walking and cycling amenity and connectivity (active transport)
  - transit oriented developments.

In undertaking this report and assessing targets for 2030, the Taskforce has reviewed a range of international and national transport plans and initiatives including:

- > The International Public Transport Association's (UITP) PT x 2 Strategy and relevant position papers
- > State and territory transport and capital city plans (where they exist)
- > North American strategic transport plans, including Transit Vision from the American Public Transportation Association and the Canadian Urban Transit Association.
- > The Blueprint for an Active Australia and the Toronto Charter for Physical Activity.

## The Taskforce believes that with the right action from the Australian Government and State, Territory and Local Governments, by 2030:

- > Public transport, walking and cycling will account for an increased modal share in our major cities, and 30 per cent of all passenger trips in our capital cities
- > Carbon emissions from the passenger road transport sector will be 50 per cent below 2000 levels
- > The amount of fuel consumed by the road transport sector will be 30 per cent less than current levels
- > A range of mobility and transport modes will be convenient and accessible for all Australians.

These targets are consistent with other vision statements we have reviewed in developing this report.

This report outlines how to achieve these outcomes, and what the benefits will be for Australia's economy, environment and people.

# MOVING AUSTRALIA 2030

> A TRANSPORT PLAN FOR A PRODUCTIVE AND ACTIVE AUSTRALIA

## A REPORT FROM THE MOVING PEOPLE 2030 TASKFORCE



AUSTRALIAN LOCAL  
GOVERNMENT ASSOCIATION



AUSTRALASIAN  
RAILWAY  
ASSOCIATION



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## FOREWORD

The goal of the Moving People 2030 Taskforce is to see national non-partisan leadership to deliver policies and programs that will ensure Australia remains the best country in the world to live.

This report outlines a whole-of-system approach to how we fund transport infrastructure, how we move people, how we move goods, and how we better integrate our spatial planning systems with effective transport networks.

By 2030 Australia's transport system should be a key foundation on which a prosperous, sustainable, liveable and healthy Australia is built.

The membership of the Moving People 2030 Taskforce (the Taskforce) is drawn from a broad cross section of organisations with an active involvement in Australia's transport system.

This first report of the Taskforce, *Moving Australia 2030: A Transport Plan for a Productive and Active Australia*, is intended for federal, state and territory parliamentarians, policy decision makers and non-government organisations, who are all partners in delivering a prosperous, sustainable, liveable and healthy Australia by 2030.

This report sets out pathways for the establishment of a transport, land use management, planning and funding framework, including how we move people, today and in the future, to maintain the living standards we currently enjoy in Australia.

While this report has a focus on overall improvements to our land transport system, it is not to be seen as a simplistic call for more money.

The Taskforce understands the realities facing all levels of government in a budget constrained environment, and recognises the impacts of current global economic challenges that will be felt over the next two decades to 2030.

The Taskforce believes, based on existing Australian Government and state government expenditure levels, there are efficiencies to be found.

In identifying these efficiencies, this report considers the links between the Taskforce's key goals and the

objective of ensuring our transport system forms the basis for a prosperous, sustainable, liveable and healthy Australia in 2030.

The Taskforce also sees the need for continued and increased investment in mass, social and active transport.

The Taskforce believes public and active transport networks in Australia represent an opportunity for savings to our economy, improving the liveability of our major cities and regional centres, enhancing the health of the population and ensuring the environment is protected for generations ahead.

The Taskforce believes increased investment in how we move people should not be seen as competing against other portfolio areas such as health, environment or social welfare, but rather as providing a net benefit from the positive outcomes generated by getting our transport systems right.

This report presents arguments that highlight the benefits of investment in moving people infrastructure, policies and programs; arguments that go beyond economic cost-benefit assessments, and consider the long-term wellbeing and quality of life of every Australian.





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## VISION STATEMENT

### Our vision for moving people in Australia by 2030 is:

- > An integrated and multi-modal system that will safely and efficiently move Australians and our goods.
- > A high quality of life for Australians from continuous improvement in sustainability and liveability of our cities and regions, through:
  - the development of world class public transport systems and improved freight networks
  - walking and bicycling amenity and connectivity (active transport)
  - transit oriented developments.

In undertaking this report and assessing targets for 2030, the Taskforce has reviewed a range of international and national transport plans and initiatives including:

- > The International Public Transport Association's (UITP) *PT x 2 Strategy*
- > State and Territory Transport and Capital City Plans (where they exist)
- > North American strategic transport plans including *Transit Vision* from the Canadian Urban Transit Association and the American Public Transportation Association
- > The Blueprint for an Active Australia and the Toronto Charter for Physical Activity.

### The Taskforce believes that with the right action from the Australian Government and State, Territory and Local Governments, by 2030:

- > Public transport, walking and bicycling will account for more than 30 per cent of all passenger trips in our capital cities-

- > Carbon emissions from the passenger road transport sector will be 50 per cent below 2000 levels
- > The amount of fuel consumed by the road transport sector will be 30 per cent less than current levels
- > A range of mobility and transport modes will be convenient and accessible for all Australians.

These targets are consistent with other vision statements we have looked at in developing this report.

This report outlines how to achieve these outcomes, and what the benefits will be for Australia's economy, environment and people.

### The principles for delivering our vision are:

**Sustainability** – Our future transport system should improve, sustain, and integrate with its surrounding environment.

**Efficiency** – Planning for our future transport systems should focus on maximising their energy efficiency, including through increasing trips by active modes.

**Value for Money** – Our transport network should improve access to low and no-cost modes such as public transport, bicycling and walking.

**Health Promoting** – Encouraging and supporting walking, cycling and public transport use promotes health and counters obesity, cardiovascular disease and other chronic conditions.

**Innovation** – New technology, public policies, ideas and solutions should be adopted to meet our future mobility needs, freight challenges and infrastructure requirements.

**Adaptability** – Our transport systems of the future should be readily adaptable to economic, demographic and technological changes.

**Resilience** – Our transport networks and public transport systems should be resilient to the impacts of natural disasters, climate change and global events.

**Equity** – Our transport networks and public transport systems should provide for equal access to resources and opportunities including education, jobs, housing, services and recreation.

**Affordability** – Our transport networks and public transport systems should provide a range of mobility options to minimise costs for families, individuals and the community as a whole.

**Subsidiarity** – Transport planning and services should be delivered by the level of government most able to identify what is needed, and funded by the level of Government that is most able to fund them.

**Integration** – Policies and programs should be integrated across different levels of government, across transport modes, across portfolios and with industry and communities.

**Community** – The planning and delivery of our transport systems should be informed by the views and values of the Australian community and should aim to increase cultural vitality in our cities and regions.

## Our goals for Australia's 2030 transport system are:

### Sustainability

To improve and sustain our natural environment, and maximise the efficiency of our built environment, through:

- > Reducing transport-related greenhouse gas emissions and pollution
- > Innovating to improve the fuel efficiency of our existing vehicle fleet, and to improve the efficiency of future vehicles
- > Encouraging active and inclusive lifestyles and active mobility choices
- > Better planning for the integration of new developments with transport infrastructure.

### Prosperity

To deliver efficiency and growth, and maintain Australia's high standards of living, through:

- > Reducing the economic impacts of traffic congestion in our cities
- > Building a more affordable and efficient transport system
- > Reducing the dependence of our transport system on fossil fuels
- > Improving productivity and health through increased physical activity
- > Increasing the efficiency of our freight and distribution networks
- > Improving social equity and the skills base of our work force through access to employment and education opportunities for all Australians
- > Improving the efficiency of road freight networks through better urban planning for residential development.

### Liveability

To improve the quality of life in our communities through:

- > Working across built environment disciplines (planning, transport, architecture, health and others) to address how people move
- > Maintaining and improving the sense of community and wellbeing in our urban and regional centres through providing a range of healthy and accessible mobility options which are available to all Australians
- > Better planning and foresight in investment to prevent overcrowding on our public transport systems
- > Improving the amenity of our cities through reducing traffic congestion
- > Improving provision of social and economic opportunities in-place, especially for elderly and young people through improved transport networks.

### Health

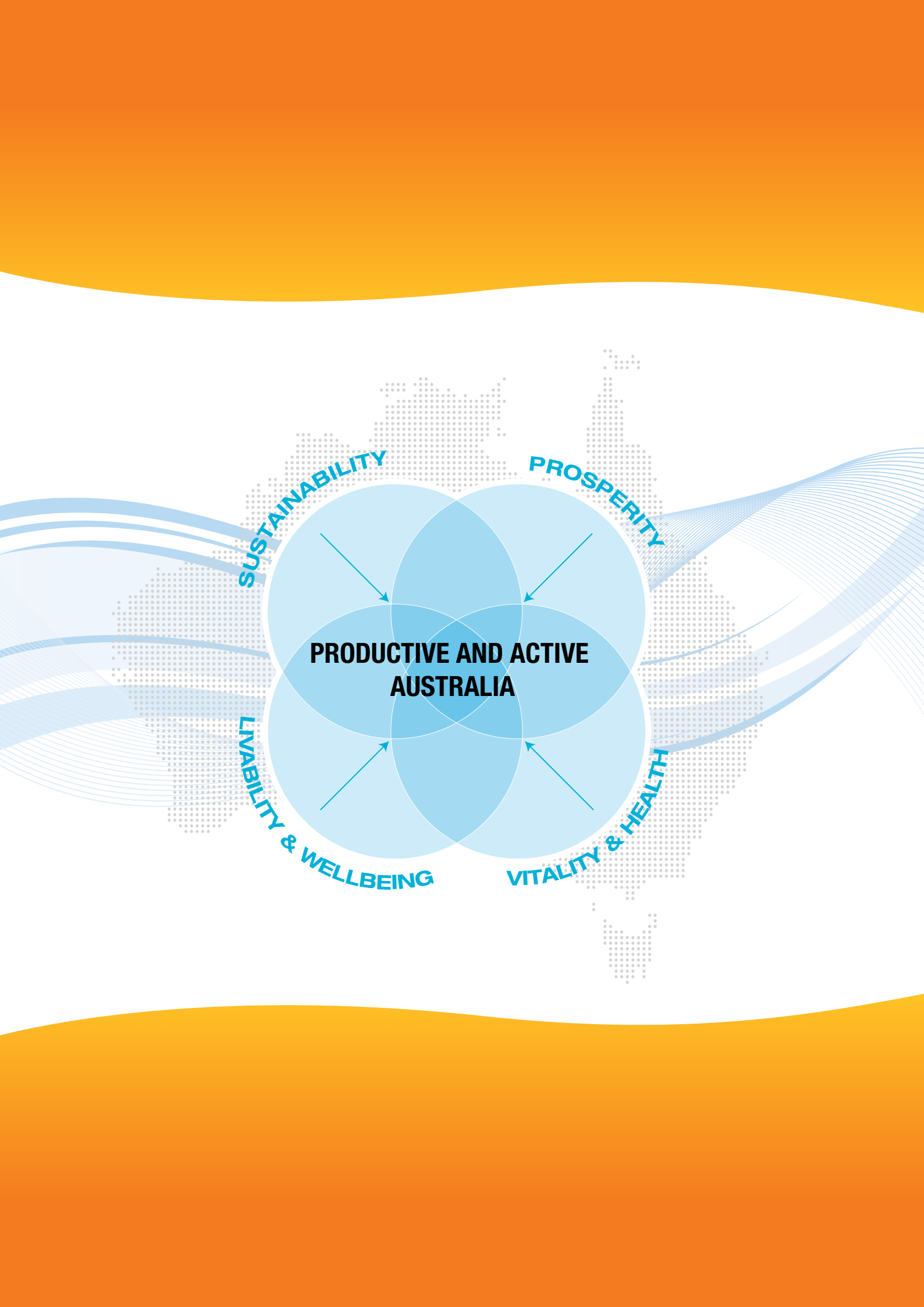
To improve the health and wellbeing of our cities, regions and population through:

- > Innovation in the design of our urban and regional



centres to make walking, cycling and public transport use easy, safe and attractive options and create opportunities for increasing levels of incidental daily physical activity

- > Highlighting the health benefits of travel by public transport, walking and cycling
- > Improving the health of our cities by reducing congestion and pollution
- > Improving the health of our built environment through better practices in the planning, infrastructure and building sectors to create *healthy spaces and places*
- > Connecting people to social and cultural activities and retaining a sense of place among our ageing population, allowing for ageing in place.



SUSTAINABILITY

PROSPERITY

PRODUCTIVE AND ACTIVE AUSTRALIA

LIVABILITY & WELLBEING

VITALITY & HEALTH

# EXECUTIVE SUMMARY

*Moving Australia 2030: A Transport Plan for a Productive and Active Australia is intended for federal, state and territory parliamentarians, policy decision makers and non-governmental organisations who are all our partners in delivering a prosperous, sustainable, liveable and healthy Australia by 2030.*

*This report sets out pathways for the establishment of a transport, land use management, planning and funding framework, including how we move people today and in the future, to maintain the living standards we currently enjoy in Australia.*

## Introduction

The quality of life Australians will enjoy in 2030 will depend on our ability to deliver fast, reliable and accessible transport networks.

In the next two decades, Australia's population will grow and change significantly; climate change, traffic congestion and public health will be concerns for governments and the community, and our economy will continue to evolve.

Our transport system will play a vital role in meeting these challenges and ensuring Australia remains a prosperous nation.

Our transport system will also increasingly play a broader social role, encouraging active and inclusive lifestyles to improve the health and wellbeing of Australians.

## Targets for 2030

The Moving People 2030 Taskforce has set out a number of tangible targets for the year 2030, namely:

- > Public transport, walking and bicycling will account for more than 30 per cent of all passenger trips in our capital cities
- > Carbon emissions from the passenger road transport sector will be 50 per cent below 2000 levels
- > The amount of fuel consumed by the road transport sector will be 30 per cent less than current levels

- > A range of mobility and transport modes will be convenient and accessible for all Australians.

## Goals for 2030

In outlining a *Transport Plan for a Productive and Active Australia* the Taskforce has focussed on achieving four critical objectives for Australia's transport system in 2030:

**Sustainability** – to improve and sustain our natural environment, and maximise the efficiency of our built environment

**Prosperity** – to deliver efficiency, growth and maintain our high standards of living

**Liveability** – to improve the quality of life in our communities

**Health** – to improve the health of our cities, regions and population.

## Chapters in this Report

**Chapter 1: Our Transport System in 2030: a Sustainable Nation** considers a range of key challenges that face the transport system, including population growth and ageing, changing travel needs and patterns, integrating transport and land use planning, climate change and energy security. It provides recommendations to address these challenges as part of building a sustainable nation.

**Chapter 2: Our Transport System in 2030: A Prosperous Nation (Infrastructure and Congestion)**

is the first of three chapters devoted to measures and actions to build a prosperous nation. It focuses on the infrastructure challenges facing the transport system both in terms of developing new infrastructure and efficiently using existing infrastructure through initiatives such as congestion charging.

**Chapter 3: Our Transport System in 2030: A Prosperous Nation (Funding)** explores a range of measures to provide governments with a more sustainable framework on which to fund land transport infrastructure projects and programs, including consideration of a more comprehensive approach to road pricing and transport taxation arrangements and incentives.

**Chapter 4: Our Transport System in 2030: A Prosperous Nation (Freight)** deals specifically with the relationship between an efficient and effective freight sector and the overall transport system.

**Chapter 5: Our Transport System in 2030: A Liveable Nation** explores how the task of moving people in 2030 will be affected by how we plan and build our cities over the next two decades. In particular, it looks at measures to achieve greater integration between transport and land use planning and build a liveable nation.

**Chapter 6: Our Transport System in 2030: A Healthy and Active Australia** examines the role of the transport system in creating a healthy society. It focuses on cycling and walking as an indispensable part of an integrated multi-modal approach to transport planning.

## Recommendations

The Taskforce has outlined a set of recommendations to government and policy makers for delivering a world-class transport system for Australia by 2030.

These recommendations can act as an effective road map for the next two decades in guiding the development of transport policy.

The Taskforce considers that effectively responding to these recommendations will be critical in achieving our vision for moving people in Australia by 2030.

Recommendations are presented in their order of appearance in this report and in some instances recommendations have been repeated throughout the report to highlight their multi-factorial value.

## Chapter 1

1. The specific needs of older commuters are considered in relevant strategies from the Australian Government.
2. Decongest our cities through innovative and flexible practices such as:
  - > Staggering school hours
  - > Flexible work hours for and diversified employment bases for all government employees
  - > Reprioritising low carrying routes to address overcrowding on high patronage routes during peak periods
  - > Fare pricing incentives
  - > Increased frequency and span of operating hours for public transport services.
3. State Governments to develop connected ‘hub and spoke’ public transport networks for capital and major cities and regions.
4. Ensure that the majority of infill development occurs around high capacity, high frequency transport corridors. To achieve this, transport plans should be integrated into the objectives and targets of state planning strategies.
5. Develop the best practice TOD process agreed by Transport and Planning Ministers and COAG.
6. Federal, State and Local Government to promote and incentivise building of TOD by:
  - > Undertaking a review of planning law to streamline and encourage approval of TOD’s
  - > Developing a best practice manual including principles and guidelines.
7. The Taskforce supports the development of high speed rail along Australia’s east coast and urges the Australian Government to acquire the land for the high speed rail corridor.
8. Any carbon pricing system to be undertaken by the Australian Government should reflect the environmental and health impacts and benefits of different modes of transport, and include



complimentary measures such as investment in encouraging low-carbon transport choices.

9. The public transport vehicle fleet to transition to low emissions and high fuel efficiency technology by 2030.

## Chapter 2

1. Develop a set of Moving People Infrastructure criteria for all Australian Government funded transport infrastructure projects that:

- > Recognise the value of small to medium scale public and active transport infrastructure
- > Facilitate an objective assessment of all benefits associated with these projects
- > Recognise the impact of freight and non-transport related infrastructure investment.

2. Infrastructure for active travel and integrated rapid transit systems is prioritised in federal and state funding programs for identified corridors.

3. The introduction of a State by State 'Better Use' research program for existing public transport, walking and cycling infrastructure.

4. Through the Standing Council on Transport and Infrastructure:

- > Agree on a mechanism to conduct congestion charging trials in capital and major cities
- > Analyse the potential network wide benefits and costs of introducing variable congestion pricing on existing tolled roads or lanes
- > Analyse the benefits and costs of providing alternate travel choices within the areas that road use charges are collected
- > Undertake comprehensive community education and information programs about congestion charging.

5. The Australian Government and State and Territory Governments update the 1995 National Guidelines for Travel Demand Management (TDM) initiatives and investigate opportunities for implementation of TDM programs.

6. The Australian Government implement telework options for Australian Government employees, and through consultation with industry establish a set of implementation guidelines for teleworking in the private sector that includes voluntary targets for 2030 by sector.

7. Relevant jurisdictions to implement the following measures to encourage car sharing:

- > Providing stamp duty incentives to encourage car share operators to use low emission vehicles
- > Expanding car share bay allocations for inner-city and metropolitan areas
- > Allowing car share bays to replace conventional parking spaces for residential development approvals
- > Amending Compulsory Third Party insurance premiums for car share vehicles to accurately reflect risk of accident

- > Establishing car share schemes for government organisations

- > Integrating car share schemes with public transport smartcards.

8. The Australian Government and State Governments adopt the Transport for NSW survey model for assessing the performance of and security issues associated with commercial carpooling programs already in operation.

9. Governments to investigate opportunities for providing user incentives for carpooling programs.

10. State and Territory Governments to implement practices and policies to manage parking in major cities that:

- > Facilitate good environmental, social and economic outcomes
- > Serve as a TDM tool for reducing car use and congestion in CBD areas

- > Provide a revenue stream for investment in alternative and sustainable transport modes and services.

11. The Australian Government, in consultation with state and local governments, identify minimum service and coverage levels for passenger and active transport networks in regional centres.

12. The Australian Government, in consultation with state and local governments, fund a program directed at the trial of Passenger Transport Social Enterprise in Local Government Areas in each state and territory.

13. The Taskforce supports the development of High Speed Rail (HSR) along Australia's east coast, and urges the Australian Government to acquire the land for the HSR corridor.

### Chapter 3

1. Standing Council on Transport and Infrastructure to investigate the options for sustainable funding of transport infrastructure on page 80 of this report.
2. Implement tax based incentive schemes to encourage work related public transport trips.
3. Implement targeted incentives or ride to work incentive schemes to increase bicycling mode share as a percentage of all trips to work and education.
4. Any carbon pricing system to be undertaken by the Australian Government to reflect the environmental impacts and benefits of different modes of transport and include complimentary measures such as investment in encouraging low-carbon transport choice; public transport, walking and cycling.
5. Implement public transport asset depreciation incentives for public transport operators.

### Chapter 4

1. State Governments develop 2030 freight strategies as a condition of funding under the Nation Building Program within the requirements of the National Urban Policy.
2. The Taskforce recommends that the Australian Government implement mass-distance-location charging for heavy vehicles that includes recognition of the environmental and social benefit of buses.

### Chapter 5

1. Based on post delivery monitoring of existing Liveable Cities projects expand and increase funding to the Liveable Cities program.

2. Establish an Australian Government portfolio which will:

- > Integrate land use and transport planning considerations at an Australian Government level

- > Oversee the adoption and implementation of Capital Cities Planning Criteria agreed to by the Council of Australian Governments

- > Oversee the delivery of an expanded Liveable Cities program funding and set of projects

3. Through research and evidence gathering, assist State and Local Governments to improve structure and concept planning for new land development areas to reflect best practice in integrated land use and transport planning.

### Chapter 6

1. Incorporate health benefit factors in cost benefit frameworks for all federally funded transport projects.

2. Fund and expand initiatives that incorporate health in urban planning to create healthy and sustainable outcomes. Develop and fund a national active travel strategy embracing walking, cycling and public transport, building on recommendations of the Walking, Riding and Public Transport discussion paper (2012).

3. Provide sustained infrastructure funding that supports active travel (for example, renew and expand the \$40 million National Bike Path program) and require all federally-funded state/territory transport infrastructure projects to incorporate or enhance active travel where feasible.

4. Establish an active travel office to coordinate and manage the active travel strategy.

5. Establish and support a walking, riding and access to public transport council to provide advice to Transport Ministers and the Standing Council on Transport and Infrastructure.

6. Require all federally funded state/territory transport infrastructure projects to incorporate or enhance active travel where feasible.

7. Provide financial incentives (tax and price) to make walking, cycling and public transport cheaper and easier choices.

8. All Governments should work with active travel stakeholders to improve integration between cycling, walking and public transport.
9. Support active living and ageing principles by funding implementation of the Healthy Spaces and Places initiative.
10. Support programs that encourage active travel to school and other educational facilities.



*By 2030 five million additional  
people will live in Australia*



# ***CHAPTER 1***



## **OUR TRANSPORT SYSTEM IN 2030: A SUSTAINABLE NATION**

*In order to achieve our vision for moving people in Australia in 2030, the Taskforce has considered a range of key challenges that face Australia's transport systems.*

*These challenges include population growth and ageing, changing travel needs and patterns, integrating transport and land use planning, climate change and energy security.*

### **1.1 Population: What it means for Public Transport, Walking and Cycling**

#### **1.1.1 Population**

By 2030 five million additional people will live in Australia and the age distribution of the population will have changed considerably.

This growth and ageing of Australia's population will have significant impacts on the sustainability of our nation and how we move people in the future, including:

- > How we will travel and work
- > Future land use and planning
- > Carbon emissions and pollution
- > Energy security.

By 2030 changing demographics will play a huge part in transport planning. As Australia faces an ageing population, supporting mobility and social inclusion will become an increasingly important responsibility of public transport.

A strong and far-sighted reform agenda is required to meet the impact of a rising ageing population.

#### **1.1.2 Population Urbanisation and the Rising Cost of Congestion**

Australia's \$9.4 billion congestion bill is set to double

by 2020, and grow exponentially through to 2030 and beyond if left unchecked. Without significant reform, the compounded cost of every extra person on Australia's often at-capacity transport networks will impact on the employment opportunities, productivity and social well-being of the next generation.

Consequently, transport infrastructure must be 'future-proofed' with in-built capacity for later expansion. This includes preserving transport corridors, integrating transport planning with residential and commercial development, and ensuring adequate resources are available.

Australian cities are among the world's most urbanised. In 2010, it was estimated that over three-quarters of the Australian population lived in capitals and other major cities of more than 100,000 inhabitants. Of these, approximately 64 per cent of the entire population lived in capital cities.<sup>1</sup>

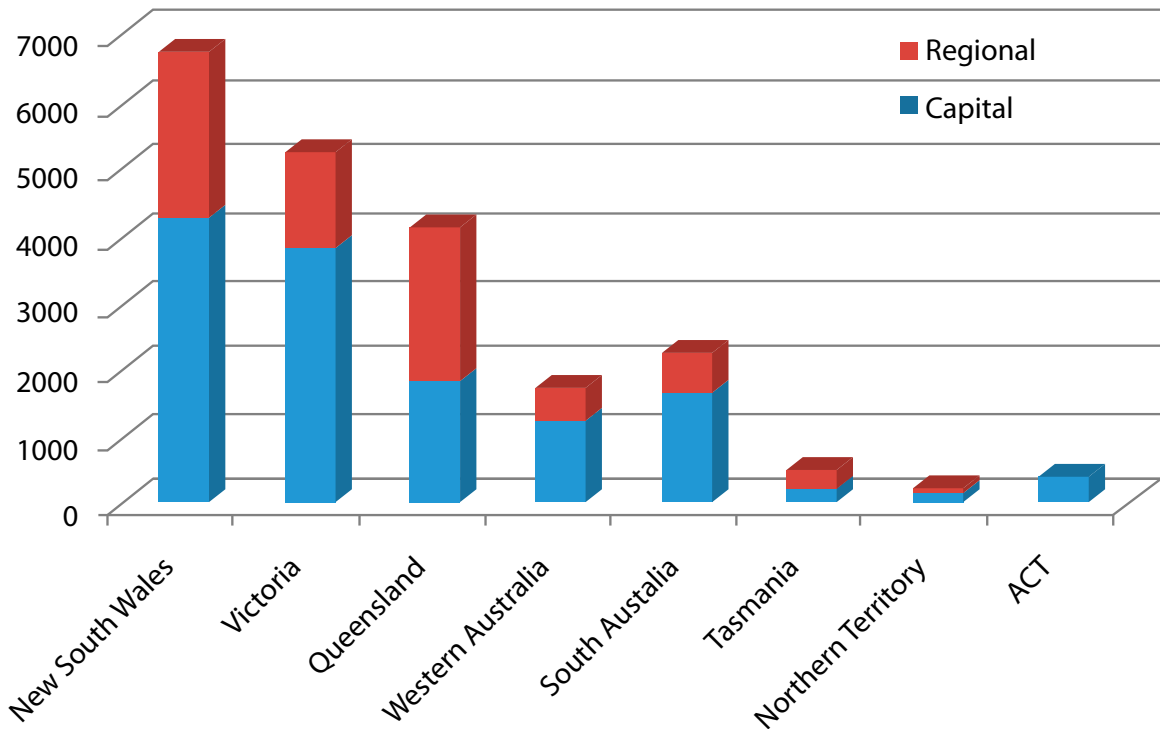
New South Wales, Victoria, Western Australia and South Australia have the most dominant capital cities as they are home to more than half of the total population in those States. (See Figure 1.1)

The four largest capital cities, Sydney, Melbourne, Brisbane and Perth, together accounted for almost 60 per cent of national population growth from 2001 to 2010, despite substantial migration from these cities to other cities and regions.<sup>2</sup>

1 Australian Bureau of Statistics, 2011, *Australian Demographic Statistics 2010-2011*. Australian Government, Canberra.

2 Australian Bureau of Statistics S Cat. 5220.0 Treasury, 2011, *Gross State Product 2010-2011*, Australian Government, Canberra.

Figure 1.1: Australian Population by State: Regional vs. Capital City, 2011 ('000)



Source: Australian Bureau of Statistics

Australia’s trend towards urbanisation will continue to 2030, by which time more than 90 per cent of Australians will live in cities, towns and near-city regions. This will put Australia second in the world behind Argentina for the highest urban population as a percentage of our total.<sup>3</sup> (See Table 1.1)

Table 1.1: Urbanisation in selected countries between 1950 and 2030

Country	1950 Urban population as percentage of total	2010 Urban population as percentage of total	2030 Urban population as percentage of total (Estimate)
Argentina	65.3	92.4	93.2
Australia	77.0	89.1	91.9
Brazil	36.2	86.5	91.1
Chile	58.4	89.0	92.3

Source: Modified from World Bank

The increasing urbanisation of Australia’s population will lead to denser cities and sparser rural and regional centres. This will require the dual task of managing more congested urban environments as well as increasingly isolated rural ones. Increasing urbanisation will also have a significant impact on congestion in our major cities. Currently, population growth is responsible for almost 12 per cent of the increase in the costs of congestion. Australia’s congestion bill is expected to reach \$20.4 billion by 2020, and continue to escalate to 2030.

Combating the congestion effects of a growing population is not just a matter of widening roads and increasing the number of public transport services. As the physical limits of major urban environments begin to become more pronounced, major cities will need wholesale reform that fundamentally transforms how people work, move and live.

Population, urbanisation, congestion challenges and their possible solutions are addressed more fully in later chapters of this report.

<sup>3</sup> Yassigh, A and vom Howe, T, 2012, *Urban Population Growth Between 1950 and 2030*, City Mayors Statistics, accessed online at: <http://www.citymayors.com/statistics/urban-population-intro.html>.

## 1.2 How we will Travel and Work in 2030

### 1.2.1 Changing demographics and mobility

The demographic composition of Australia in 2030 will influence how transport networks are designed and operated. As Australia faces an ageing population, the needs of those who use both public and private transport will shift significantly. By 2030, it is estimated that there will be more than twice as many people aged 65 years or older than there are today, with 1 in 5 Australians aged over 60. The number of people aged 85 and over will be almost 3 times larger than today.<sup>4</sup> (See Figure 1.2)

As Australia's ageing population increases, public transport will play an increasingly vital role for those less mobile. Mobility consistently ranks as one of the top concerns for those most at risk from social exclusion.<sup>5</sup>

Accessible and inexpensive public transport enables older people to engage with the broader community, access medical care as well as work and volunteer. Providing better public transport for those who cannot access or afford private transport is vital for the health and well-being of Australia's most at-risk citizens.

In order to accommodate the expected demographic change, transport planning must consider the specific needs of older commuters.

Research indicates older people have a higher than average aversion to interchanging even if it reduces travel times, as well as having a tendency to value comfort and amenity over reliability or frequency.<sup>6</sup> There is also a need for clear, accessible and wheelchair friendly services. All of these factors must be increasingly considered as necessary to accommodate the demographic shift that will occur in Australia to 2030.

**Recommendation:** *The specific needs of older commuters are considered in relevant strategies from the Australian Government.*

### 1.2.2 The Private Car and Mobility

Australia has one of the world's highest private motor vehicle mode shares in the world, with close to 90 per cent of all trips taken by car. 99.9 per cent of private vehicles run on fossil fuels, and despite a move towards smaller vehicles and a greater awareness of the need for energy conservation and energy efficiency, total fuel consumption is rising.<sup>7</sup>

Between 1998 and 2007 total consumption for all types of petrol rose from 16,062 million litres to 18,876 million litres, a rise of 18%. Over the same period the consumption of diesel fuel rose from 5,840 million litres to 9,372 million litres, an increase of 60%, while the use of other fuels types fell by 10%, from 2,007 million litres in 1998 to 1,799 million litres in 2007.<sup>8</sup> In the year ended 31 October 2007 Australia's 12 million registered passenger vehicles travelled an estimated 158 billion passenger kilometres, each averaging 14,300 km per year.

Creating a modal shift from private car use to public transport will be one of the most influential determinants of whether Australia can reduce soaring carbon emissions by 2030. In 2009, 87 per cent of emissions were generated by road transport, with passenger cars accounting for 53 per cent.<sup>9</sup> Buses, by comparison, emit far less, at 2 per cent. (See Figure 1.3)

While rising costs of private car use and increased travel times caused by congestion have slightly affected mode share, this has failed to attract a significant proportion of motorists to shift to public transport.

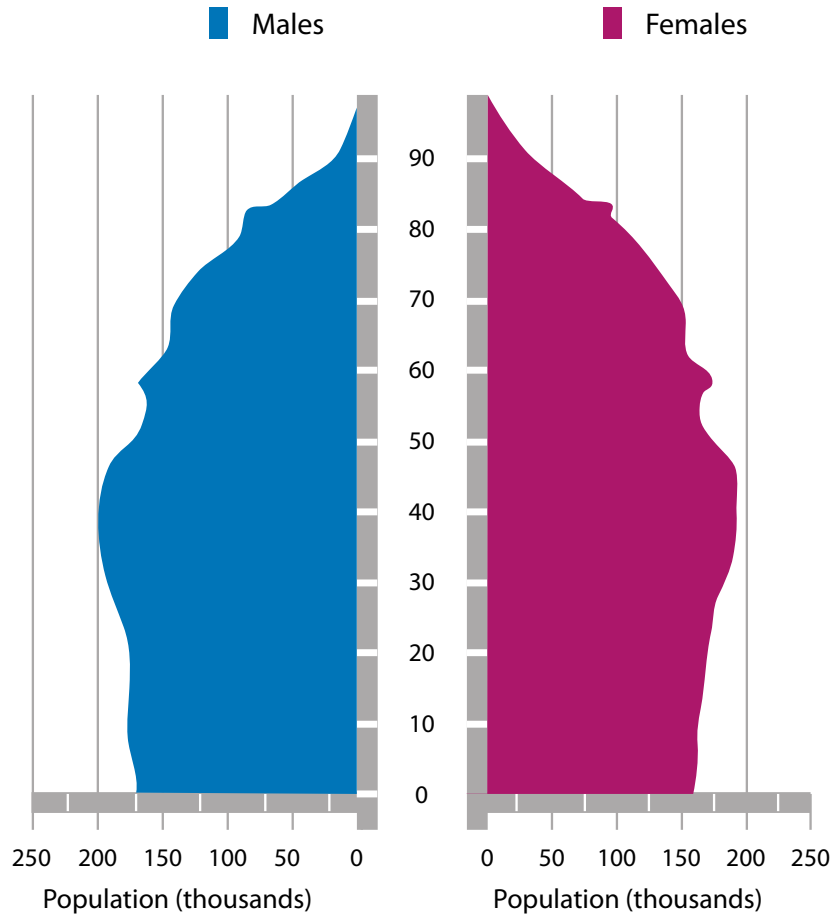
By 2009 there was more than 1 passenger vehicle for every two Australians. The number of registered vehicles

4 Australian Bureau of Statistics, 2011, *Australian Demographic Statistics 2010-2011*. Australian Government, Canberra.  
5 NSW Department of Family and Community Services, 2010, *Towards 2030: Planning for our Changing Population*, NSW Government, Sydney.  
6 Tourism and Transport Forum, 2010, *Improving Your Commute: Lifting Customer Service in Public Transport*, Tourism and Transport Forum, Sydney.

7 Tourism and Transport Forum, 2010, *Position Paper: Benefits of Public Transport*, Tourism and Transport Forum, Sydney.  
8 Australian Bureau of Statistics, 2010, *Yearbook Australia 2009-2010*, Australian Government, Canberra. Accessed online at: <http://www.abs.gov.au/ausstats/abs@.nsf/0/321136439E3661E8CA25773700169CE4?opendocument>  
9 Tourism and Transport Forum, 2009, *Position Paper: Public Transport and Climate Change*, Tourism and Transport Forum, Sydney.

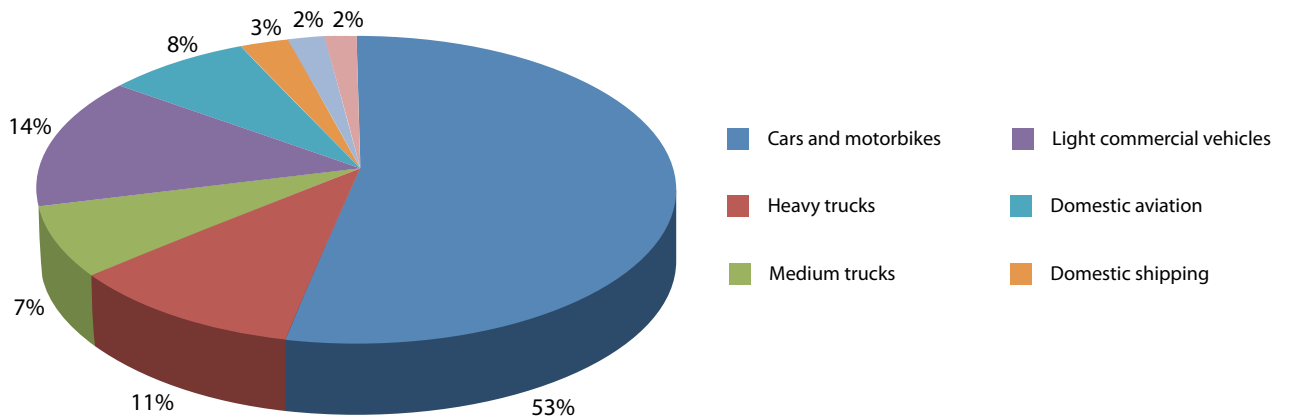


Figure 1.2: Australia's Population Pyramid 2030



Source: Australian Bureau of Statistics, 2013

Figure 1.3: Total Domestic Transport Emissions by Transport Type, 2006



Source: Garnaut, 2008, *the Garnaut Climate Change Review*

grew by more than 3 million over the ten years to 2009, which translated into an increase from 510 vehicles per 1000 people to 552 vehicles per 1000 people over the same period.<sup>10</sup>

While the growth in car ownership is predicted by the Bureau of Infrastructure, Transport and Regional Economics to flatten by 2020<sup>11</sup> (See Figure 1.4), population growth over the period will mean the number of cars on the roads will continue to increase unless measures are taken to encourage alternative transport choices and increase the share of sustainable transport modes such as walking, cycling and public transport.

Although smarter travel patterns including vehicle sharing, taking fewer trips and travelling shorter distances will see marginal reductions in emissions per vehicle, this will not combat emission increases caused by a growing fleet.

Heavy rail has the highest mode share for public transport trips in Australia at an estimated eight per cent, and currently accounts for 2.4 per cent of national transport emissions. This latter figure does not, however, include electric rail as these emissions are accounted for at the source of electricity generation.

The capacity for emissions reduction by rail is limited by Australia's reliance on coal fired electricity generation. While transition to sustainable energy generation for power stations is beyond the control of public transport operators, the Taskforce strongly affirms the need for a reduction in Australia's over reliance on coal-fired electricity by heavy and light rail.

Nevertheless, facilitating a shift to public transport as an alternative means of travel to the private vehicle will still be important to reducing carbon emissions, regardless of the means of energy generation. During peak periods, bus and rail are up to six times less emissions intensive per passenger kilometre than private vehicles.<sup>12</sup>

In an urban environment, the efficiency of public transport is unparalleled. A typical bus is capable of removing 50 to 100 cars from the road, while a train is capable of removing up to 1,000 cars from city streets.

At capacity, a typical two-track passenger railway can carry up to 25,000 passengers an hour in each direction, the equivalent of more than 20 lanes of freeway.<sup>13</sup>

Later sections of this report offer suggestions for how public and active transport modal share can be increased.

### 1.2.3 Changing Demographics, General Revenue and the Impact on Farebox Collection

An ageing population will also have a dramatic impact on how the funding of transport infrastructure is sourced.

By 2030 the ratio of workers to retirees will have fallen from 5:1 to 3:1, forcing a far smaller proportion of the population to fund the transport needs of the whole of Australia.<sup>14</sup> (See Figure 1.5)

As proportional income tax revenue declines due to this demographic shift, funding transport infrastructure will become increasingly difficult.

The Productivity Commission projects that the fiscal gap created by an ageing population will reach around 7 per cent of GDP by 2044-45, with an accumulated value over the 40 years of around \$2200 billion, and that state government spending requirements could increase by almost 1 per cent of GDP.<sup>15</sup>

*Australia to 2050: Future Challenges*, the third Intergenerational Report, identifies that due to the fiscal pressures of an ageing population, a fiscal gap will emerge in 2031-32 and grow to approximately 2.75 per cent by 2050.<sup>16</sup> (See Figure 1.6)

### 1.2.4 Changing Demographics and the Farebox

Over the long term this fall in taxation will reduce the funding available for public transport services. It will also

10 Australian Bureau of Statistics, 2010, *Measures of Australia's Progress 2010*, Australian Government, Canberra.

11 Bureau of Transport and Regional Economics, 2002, *Report 107: Greenhouse Gas Emissions From Transport – Australian Trends to 2020*, Australian Government, Canberra.

12 Tourism and Transport Forum, 2009, *Position Paper: Public Transport and Climate Change*, Tourism and Transport Forum, Sydney.

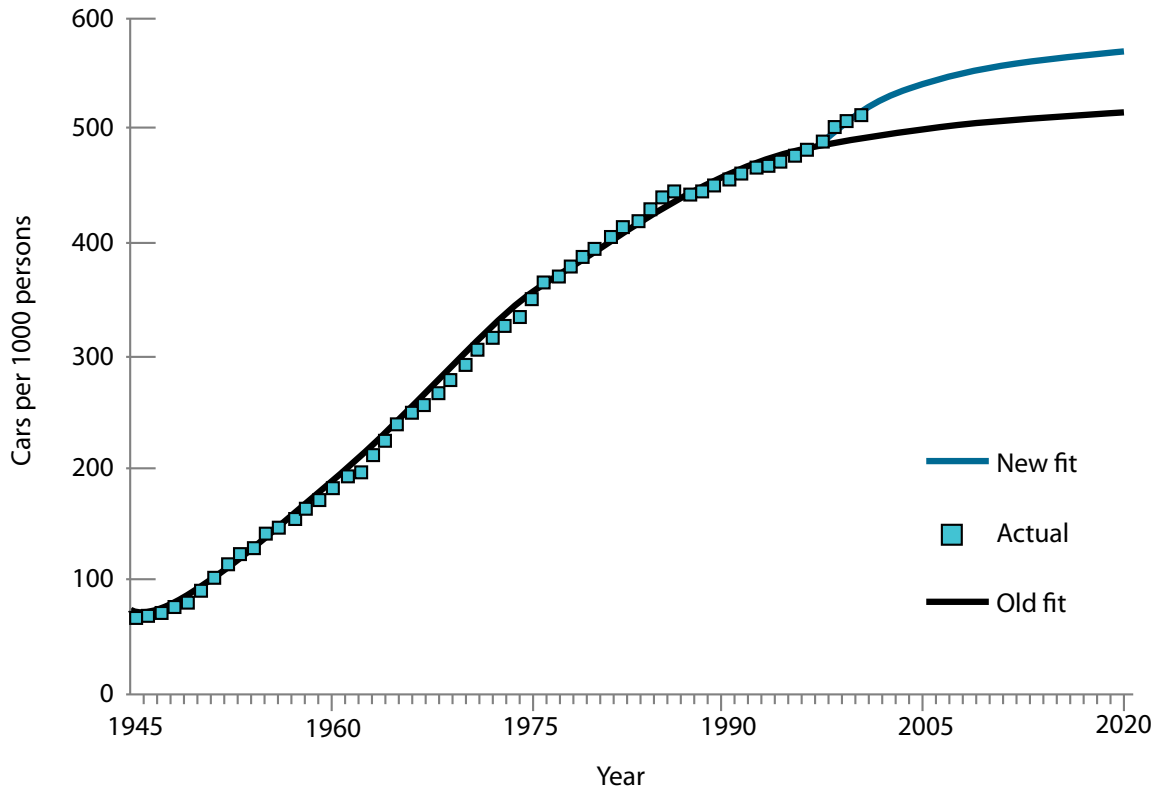
13 Tourism and Transport Forum, 2009, *Position Paper: Public Transport and Climate Change*, Tourism and Transport Forum, Sydney.

14 Australian Bureau of Statistics, 2011, *Australian Demographic Statistics 2010-2011*. Australian Government, Canberra.

15 Productivity Commission, 2005, *Economic Implications of an Ageing Australia: Research Report*, Australian Government, Canberra. Accessed online at <http://www.pc.gov.au/projects/study/ageing/docs/finalreport>

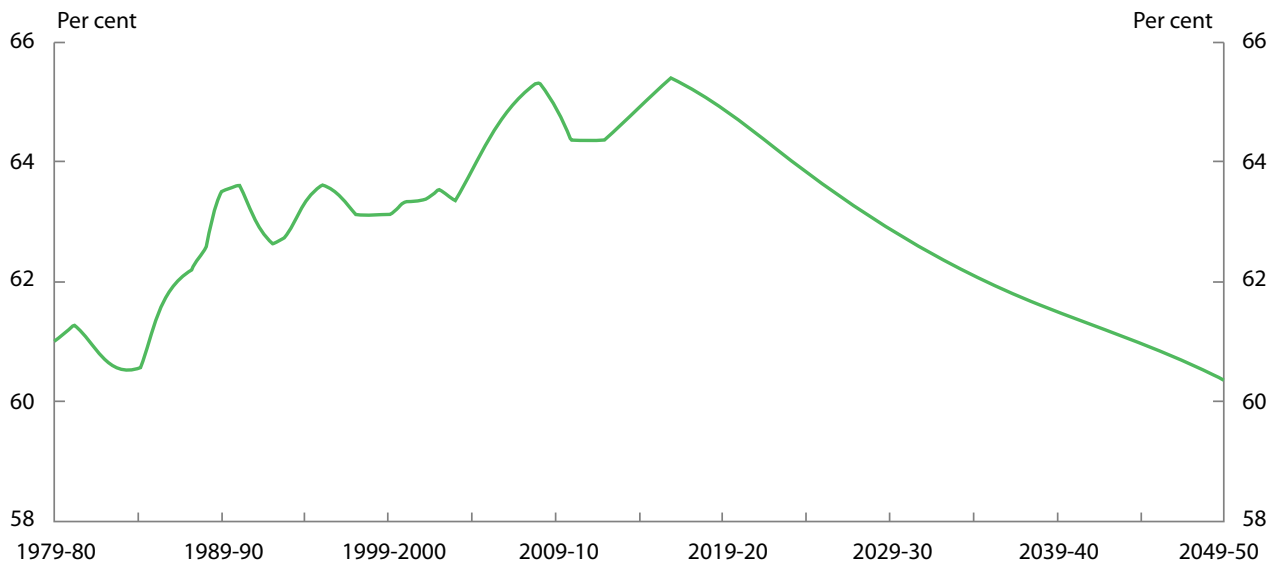
16 Attorney General's Department, 2010, *Australia to 2050: Future Challenges*, Australian Government, Canberra.

Figure 1.4: Projected Car Ownership in Australia



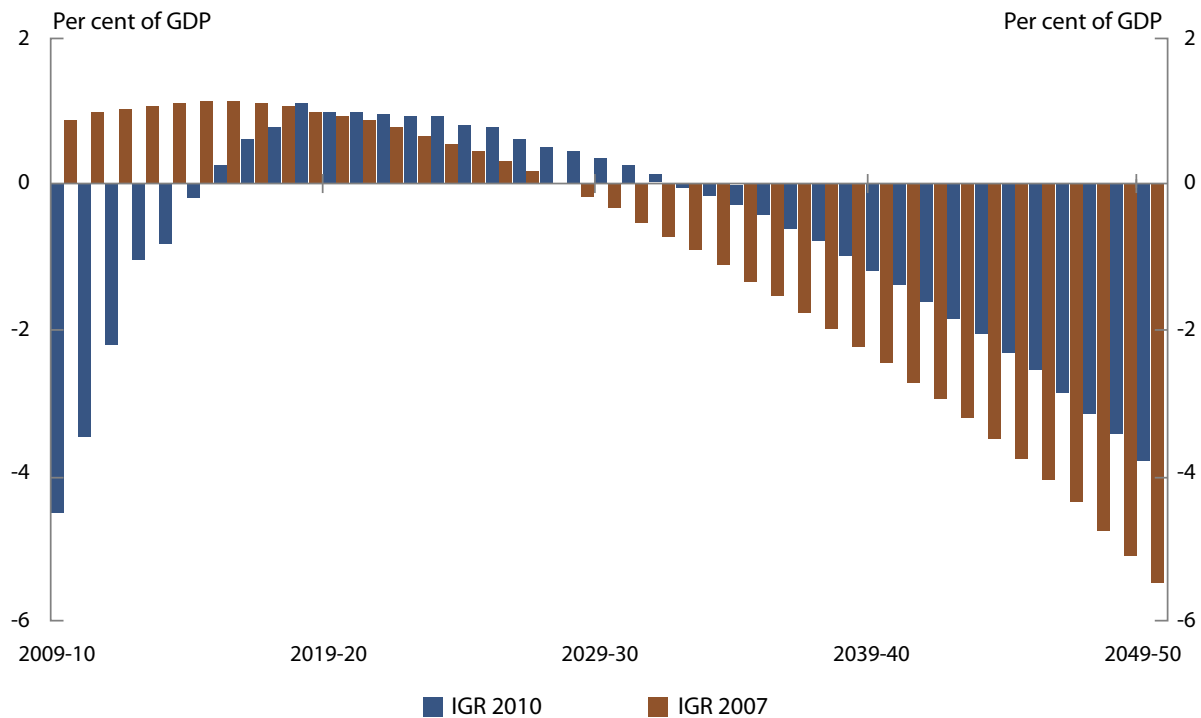
Notes: 'Old Fit' refers to the values used in an earlier report, 'New Fit' refers to revised estimates in the 2002 report allowing for price and income effects. Source: BTRE, 2002

Figure 1.5: Projected Decline in Labour force Participation Rate among Population 15 Years or Older



Source: Treasury Projections (Taken from Henry Review)

Figure 1.6: Projected Fiscal Gap to 2050



Source: Treasury Projections (Taken from the third Intergenerational Report, 2010)

reduce the revenue collected on our public transport networks, as a greater proportion of commuters become eligible for concession fares and free seniors travel.

The *State of Australian Cities 2012* Report from the Australian Government’s Major Cities Unit observes:

*“Fare recovery in Australian urban mass transit systems is already well below international best practice and continues to decline. This raises questions about the sustainability of their current financial structures and the scope for further investment in mass transport infrastructure and services.”<sup>17</sup>*

Without increasing the efficiency of transport networks, an ageing population will only add to an already high public funding burden.

For example, on Sydney’s CityRail network, the taxpayer currently subsidises an average of \$9.45 for each commuter journey.<sup>18</sup>

Table 1.2 demonstrates the fare multipliers required for different levels of cost recovery from public transport systems in operation in a number of Australian cities. These figures highlight the dire situation facing state governments with regards to the future funding of public transport systems and the need to identify innovative funding and cost recovery mechanisms.

For example in Canberra a 90 per cent cost recovery system from fare box collection would see an adult one way ticket increase in price from AUD\$2.60 to more than AUD\$13. As the proportion of concession commuters increases over time, it is not unreasonable to expect that the subsidy rate will also increase and the burden to the taxpayer will be greater.

17 Major Cities Unit, 2012, *State of Australian Cities 2012* (p4), Australian Government, Canberra.

18 Infrastructure Partnerships Australia, 2012, *Franchising Passenger Rail Services in NSW: Options for Reform*, Infrastructure Partnerships Australia, Sydney.



Table 1.2: Fare multiplier recovered for 30/60/90 per cent cost recovery

City	Fare multiplier required for 30 per cent cost recovery	Fare multiplier required for 60 per cent cost recovery	Fare multiplier required for 90 per cent cost recovery
Sydney	1.25	2.5	3.8
Melbourne	0.97	1.9	2.9
Brisbane	0.94	1.9	2.8
Perth	0.79	1.6	2.4
Canberra	1.8	3.6	5.3

Source: State of Our Cities Report, 2012

Mechanisms for sustainable funding of our future transport systems, including reform of public transport fares, are discussed in depth in Chapter 4 of this report.

### 1.2.5 Adapting to a Changing Workforce

Shifting employment demographics and the rise of more flexible work practices will have a significant impact on how people travel to and from work.

Changing priorities such as shared child duties, the rise of telecommuting and more people choosing part-time work before retirement will all affect passenger transport demand.

Travel Demand Management (TDM) is explored further in Chapter 2 of the Report.

Research by the Victorian Government forecasts that by 2030, the proportion of people working over 50 will rise from 29.1 per cent to 34.7 per cent.<sup>19</sup>

Women will also become more active in the workforce: by 2030 under a 'high' scenario, participation rates are expected to climb by 10 per cent for women in their twenties; 13 per cent for women aged between 30 and 50; 17 per cent for women in their fifties; and 19 per cent for women aged between 60 and 64.<sup>20</sup>

These changes will have profound impacts on the way people work as more complex time demands dictate working hours. In order to accommodate these changes, employers will need to provide more flexible working environments than at present.

The biggest opportunity that will arise out of more flexible workplace practices is the opportunity to attract more workers away from travelling during peak periods. Australian employers are currently lagging behind, with research examining the travel behaviours of peak commuters in Melbourne estimating that only 10 to 20 per cent of CBD employees have access to start time flexibility.<sup>21</sup>

The vast majority of Australia's passenger transport task centres on the two weekday peak-periods. As a result, the total asset requirements of a public transport operator are generally dictated by the capacity needed to service this relatively short period.

Smoothing patronage across hours of operation and away from peak periods, therefore, can have a far higher return on investment than simply increasing transport infrastructure investment.

In a constrained budgetary environment, reducing demand during peak hours presents a cost-effective mechanism for meeting the needs of a growing population.

Similarly, demographic changes and greater workplace flexibility expected over the coming decades present an ideal opportunity to reduce the current strain of peak-hour on transport networks.

There are a number of opportunities for employers to reduce peak hour strain. They include the availability of flexible work hours, where employees can choose their arrival and departure times. The introduction of the 'core-hours' initiative has had small but rising popularity in Australia, particularly in the public sector. This is similar to 'flexitime', except hours of work are predetermined, allowing for greater structure built around employee availability. Another alternative is a compressed work week, where employees are permitted to work fewer days per week but more hours per day.

<sup>19</sup> Victorian Government, 2010, *Paving the Way for Older Women in the Workforce 2025*, Victorian Government, Melbourne.

<sup>20</sup> Victorian Government, 2010, *Paving the Way for Older Women in the Workforce 2025*, Victorian Government, Melbourne.

<sup>21</sup> Tourism and Transport Forum, 2010, *Improving Your Commute: Lifting Customer Service in Public Transport*, Tourism and Transport Forum, Sydney.

Transport pricing and service frequency must accommodate the efforts of employers, and incentivise workers away from travelling during peak-periods. One alternative is creating a greater price differential based on peak and non-peak times.

Although this initiative has long been in place, the current difference in price for the majority of Australia's rail networks between peak and non-peak tickets is often not substantial enough to change commuter behaviour.

Evidence from peak analysis in Sydney, Melbourne, London and Chicago indicates demand elasticity for off-peak travel is typically 1.5 to 2 times higher than peak-period.<sup>22</sup> This means peak-hour commuters are far more likely to absorb fare increases than those in off-peak services. For pricing to be an effective mechanism for smoothing demand, off-peak tickets need to be at least 20 per cent cheaper than the peak alternative.

A strong example of this working effectively in Australia has been Melbourne's introduction of a free "early bird" ticket for passengers travelling before 7am. In its first year the initiative effectively shifted 3,000 commuters away from peak-hour, saving \$60-\$70 million.<sup>23</sup>

Adapting to more flexible travel demands by sending strong price signals will help increase fare-box revenue, reduce overcrowding, improve return on investment for capacity additions and increase passengers on counter-peak. Enacting these reforms now will ensure more efficient transport networks as well as more flexible and accessible workplaces by 2030.

**Recommendation: Decongest our cities through innovative and flexible practices such as:**

- > **Staggering school hours**
- > **Flexible work hours for and diversified employment bases for all government employees**
- > **Reprioritising low carrying routes to address overcrowding on high patronage routes during peak periods**
- > **Fare pricing incentives**
- > **Increased frequency and span of operating hours for public transport services.**

Chapter 2 of this report further investigates options such as teleworking as means of decongesting our cities.

### 1.2.6 Establishing Multi-Centre Cities

As Australia becomes more populated and urbanised, it is critical that the growth of urban centres is managed effectively to minimise congestion and ensure job accessibility for outer-suburban residents. Australia's major CBD's will not be able to handle expected population and jobs growth, and secondary and tertiary hubs will be required to take up much of this demand.

A key barrier to creating multiple-centre cities is the current radial mass transit network. Under this model, transport corridors are centred on the CBD and radiate outwards to the outer suburbs. This requires commuters to go via the CBD to access other areas of the city, causing long delays and adding unnecessary congestion to the CBD.

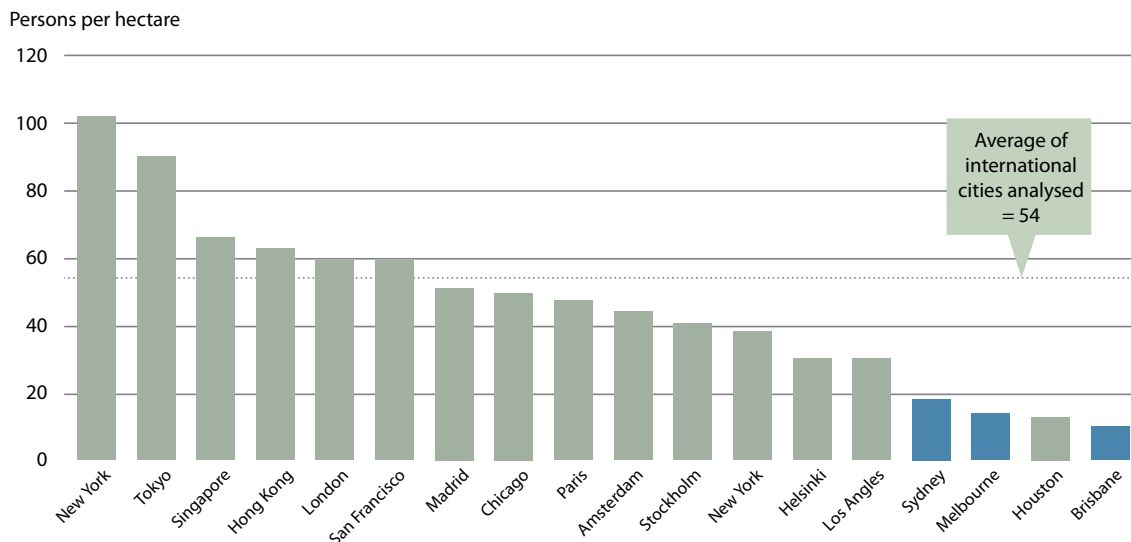
To improve interconnectivity of major centres outside of the CBD, Australia must rethink the traditional CBD-centric networks and move towards a more interconnected and multi-centred urban environment. Doing so will allow commuters to reach more destinations by public transport, increase frequencies and reduce journey times. The integration between residential and employment hubs resulting from connected hub-and-spoke public transport networks will increase the ability of outer-suburban populations to seek jobs and create wealth.

Investing in improved public transport to facilitate this transformation will ensure that Australians in 2030 are

<sup>22</sup> Tourism and Transport Forum, 2010, *Improving Your Commute: Lifting Customer Service in Public Transport*, Tourism and Transport Forum, Sydney.

<sup>23</sup> Tourism and Transport Forum, 2010, *Improving Your Commute: Lifting Customer Service in Public Transport*, Tourism and Transport Forum, Sydney.

Figure 1.7: Population Densities in Major Cities



Note: Population density statistics appear to vary widely between sources. Source: EU Urban Audit (2004), US Census Bureau, DOI (2006)

Source: Tourism Transport Forum (2010)

not excluded from certain job markets based on where they choose to live.

Sydney Buses' Metrobus strategy identifies the need to transition to a multi-centre city. Metrobus have a series of cross-city routes intersecting at a common interchange which connect a multi centre city.

Transfer and inter-modal journeys must become increasingly common under this approach to mass transit. While transfers between journeys are often initially unpopular, reduced wait times and increased reliability significantly reduce the resistance of commuters.

**Recommendation: State Governments to develop connected 'hub and spoke' public transport networks for capital and major cities and regions.**

### 1.3 Future Land Use and Planning

#### 1.3.1 Increased City Density as a Result of Population Growth

A bigger and more urbanised population will mean denser cities. Although this presents a significant congestion concern, it is also an opportunity to provide better public transport options. Greater population density, when managed effectively, can improve the quality and accessibility of public transport. One of the major causes of Australia's relatively high transport costs is low population densities in cities, which require more service km and track length per capita than many international cities.

One of the benefits of a more densely populated Australia by 2030 is that it ensures public transport is accessible for the greatest percentage of the population at a lower possible cost. As the population density of Australia increases, more connected mass transit networks need to be developed, with more interchanges and shorter service routes. Figure 1.7 highlights that in comparison to other major cities around the world, Australian cities have some of the lowest population densities per person per hectare.

### 1.3.2 Transit Oriented Development

The most important factor in maximising the benefit of a denser population is ensuring that new residential and commercial precincts are developed around major transport hubs and nodes. One of the major causes of Australia's low public transport mode share and subsequent congestion costs is that commercial and residential developments have failed to consider public transport access as a priority. To accommodate Australia's predicted population rise to 2030, development of public and active transport accessible land must be made comparatively more attractive.

Transit oriented development (TOD) refers to increasing the density of developments and facilities around transport hubs, specifically to promote public and active transport use. TOD can encompass medium to high density residential, retail and commercial space and key services such as health, education and government. Creating strong, seamless links between residential, commercial and recreational areas and public and active transport can minimise Australia's future transport challenge.

Effectively designed developments reduce the need to travel long distances for work or leisure, as well as maximising the revenue and level of asset utilisation that can be generated from public transport.

TOD is not only a vital tool in accommodating a growing population: it also presents enormous benefits for attracting people away from private cars. Research in the United States has indicated that people who live within 800 metres of public and active transport are more than twice as likely to use it as those who do not.

The mixed use of land not only creates more interesting neighbourhoods, but generates a higher public and active transport modal share, enabling commuters to avoid congested roads.

Best practice TOD suburbs integrate different modes of transport and create a 'critical mass' of public and active transport, providing focal points for government funding and attracting private sector investment. By providing higher residential densities outside the CBD, TOD's encourage the decentralisation of public and private services and bring them closer to suburban population centres.

#### 1.3.2.1 Driving Transit Orientated Development in a Growing Australia

There are a number of reasons why TOD has not proved effective in Australia; historically the most prominent has been low land prices leading to developers expanding outwards instead of upwards.

As there are additional costs for construction around transport hubs, due to disruption of services, impacts of noise and vibration and stricter safety standards, developers have favoured greenfield locations instead of increasing the density of established sites.

For TOD projects to be financially viable, they almost always have to be medium to higher density. As a result, the significant resistance that exists against these higher densities means that they have often failed in Australia.

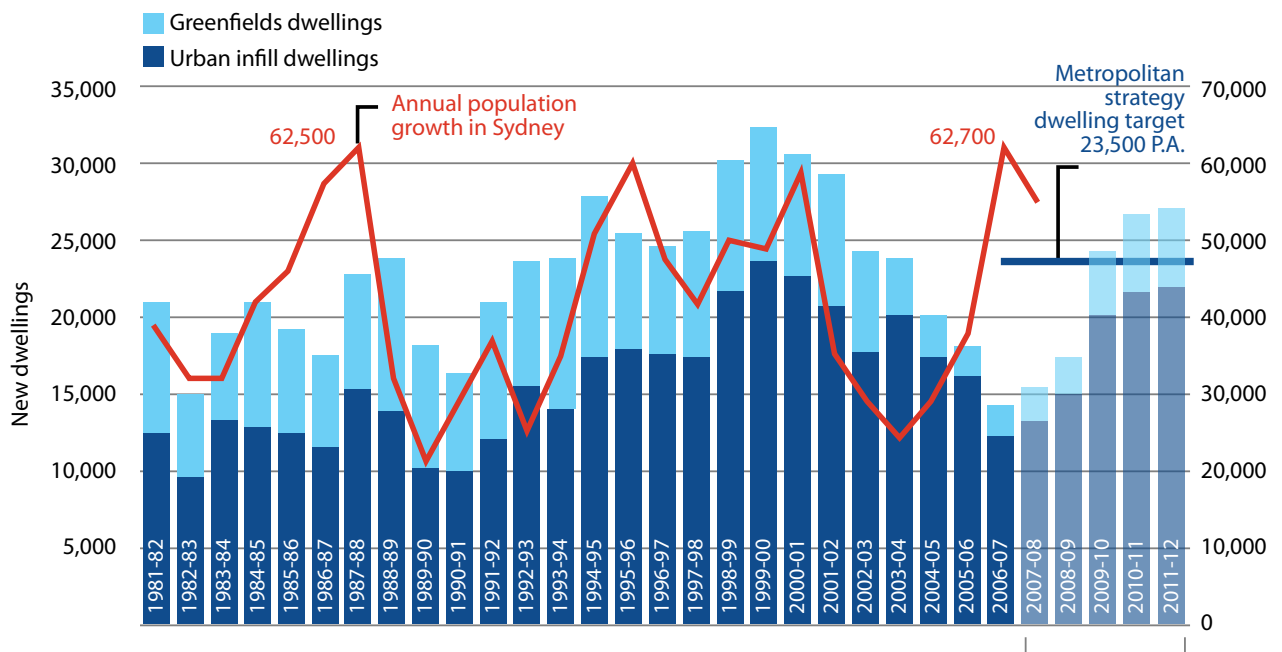
Australia's current development standards allow small scale brownfield re-developments run by small, local developers which can slowly start to change the face of Australian cities, but fail to take into account the importance of rising density. In addition, current planning laws are often not conducive to even these small scale brownfield re-developments, a factor which needs to change if the necessary urban densification is to be achieved.

As Australia continues to grow, demand for medium and high density residential will similarly rise. This trend is already taking place, with Sydney, in particular, demonstrating a growing preference for higher density residential development. (See Figure 1.8)

Chapter 5 discusses further issues related to land use and planning and elaborates on Transit Oriented Development.

**Recommendation: Ensure that the majority of infill development occurs around high capacity, high frequency transport corridors. To achieve this, transport plans should be integrated into the objectives and targets of state planning strategies.**

Figure 1.8: Greenfield and Infill Dwellings in Sydney



Source: Transport for NSW (2012)

**1.3.2.2 Principles for Transit Oriented Development**

The UITP has developed a set of principles to be considered in the design and development of TODs by governments. These are:

1. Integration of public and active transport from the very conception of urban planning projects
2. Involvement and coordination of all relevant actors
3. Private property developers to be required to support the development of public and active transport
4. Ensuring that city centres remain lively (commercial and leisure activities)
5. Trip generators to be located at public transport nodes
6. Limitation of car accessibility and adaptation of parking rules and management
7. Provision of high quality public transport from the start
8. Design of public and active transport facilities with urban development in mind

9. Focus on accessibility and connectivity not only on mobility
10. Building a 'living place' not just a public transport node.<sup>24</sup>

**Recommendation: Federal State and Local Governments to promote and incentivise building of Transit Oriented Development by:**

- > Undertaking a review of planning law to streamline and encourage approval of TODs
- > Developing a best practice guideline for designing TODs.

24 UITP, 2009, Position Paper: Integrating Public Transport and Urban Planning: A Virtuous Circle, UITP, Brussels.



## 1.4 Connecting Our Major Cities by Rail

### 1.4.1 High Speed Rail

On 4 August 2011, The Hon Anthony Albanese, Minister for Infrastructure and Transport, announced the completion of phase one of the Government's High Speed Rail (HSR) Study. The Study outlines a preliminary high speed rail corridor along the East Coast of Australia and possible costs for the introduction of HSR in this region.

The proposed \$61 - \$108 billion network will link the East Coast capitals and major urban centres, allowing Australians to travel freely along the East Coast and allowing our economy to prosper through a modern, high speed transport system. Brisbane, the Gold Coast, Newcastle, Sydney, Canberra, Wollongong, the Southern Highlands, Albury and Melbourne have been identified as potential areas to be linked by HSR.

Stage Two of the Study will look at the corridor alignment in detail, outline preliminary geotechnical issues and investigate investment and financing options. It is envisaged that the study will provide sufficient information for the implementation of HSR in Australia.

At speeds of 350 km/hr, high speed rail would provide the following travel times:

- > Brisbane – Gold Coast: 15 minutes
- > Canberra – Sydney: 1 hour
- > Sydney – Melbourne: 3 hours
- > Gold Coast – Sydney: 3 hours
- > Sydney – Newcastle: 40 minutes.

HSR is currently being built and actively planned throughout the world, including in the US, UK, Argentina, Poland, Morocco, Turkey, Iran, Portugal, Saudi Arabia and India. In Japan, the government is about to launch a high speed rail program that allows customers to travel at 500km/hr. By 2025, 37,500km of HSR lines will operate globally.

Clearly, when it comes to HSR, Australia is still behind the rest of the world. This needs to change. The challenges posed by our inefficient transport system require viable and sustainable solutions.

Australia faces a number of tough challenges in maintaining its international competitiveness, ensuring continuous economic growth and securing high living standards for its people.

Sydney Airport is at capacity, with domestic flights clogging flight paths. The viability of HSR is not reliant on a second Sydney Airport, however it could help free up desperately needed runway slots, and air paths into and out of Sydney Airport, while also providing the option to use the Canberra and/or Newcastle airports as overflow destinations.

Unlike airports, which are usually located on the outskirts of cities, HSR stations are often situated in or very near central business districts. Conveniently located stations allow customers to arrive in city centres, without the need for transport into the city, further reducing travel times.

Transport is also largely powered by fossil fuels. Burning fossil fuels creates carbon dioxide and particulates that cause air pollution. High speed rail provides a cleaner, more sustainable alternative to all other transport modes.

The scale, geographical spread and impact of Australia's transport challenges demand a comprehensive national response.

Rail can provide greater mobility for people without the significant costs of vehicle ownership like registration, insurance and maintenance. The greater mobility rail provides will allow people access to schools, hospitals, employment centres, and other social activities.

An Australian high speed network will provide better connections between regional areas and employment centres in major cities, and will encourage a shift away from cars. Fewer cars on the road will mean less traffic congestion on our roads, fewer transport related emissions and safer roads for all Australians.

Governments must consider all relevant costs and benefits of each transport mode when deciding future investments in transport. HSR and the benefits it can bring to regional Australia are discussed in Chapter 2 of this report.

To ensure the development of HSR along Australia's East Coast, the taskforce advocates for the establishment of an independent statutory authority, similar to the Snowy Mountains Hydro-electric Authority that was established to evaluate, design and construct the Snowy Mountains Scheme. The Authority oversaw the construction of 16

major dams, 7 power stations, a pumping station, and 225 km of tunnels, pipelines and aqueducts between 1949 and 1974. Almost 40 years on, the scheme is still the largest engineering project ever undertaken in Australia.

The first step in making HSR a reality in Australia will be the Australian Government acquiring the rail corridor land.

**Recommendation: The Taskforce supports the development of high speed rail along Australia's east coast and urges the Australian Government to acquire the land for the high speed rail corridor.**

## 1.5 Carbon Emissions and Pollution

### 1.5.1 The Current Landscape

Australia is the biggest emitter of carbon pollution per capita in the world, currently discharging 560 million tonnes of Carbon Dioxide equivalent (Mt CO<sub>2</sub>-e) each year. Projected emission trends to 2030 show that, without further policy action, Australia's emissions will continue to increase faster than those of the majority of other developed nations. This is due to a higher reliance on fossil fuels for stationary energy generation, as well as the impact of Australia's booming mining sector. By 2030, emissions are projected to reach 803 Mt CO<sub>2</sub>-e, or 44 per cent above 2000 levels.<sup>25</sup> (See Figure 1.9)

By 2020, The Australian Government has committed to reducing carbon emission to 5 per cent below 2000 levels unilaterally. Further, if "major developing economies commit to substantially restrain emissions and advanced economies take on commitments comparable to Australia's",<sup>26</sup> Australia will commit to a 15 per cent reduction.

If current trends continue, Australia will fail to meet even

its minimum emissions reduction target. Australia's carbon emissions are already five per cent above 2000 levels. At the current rate of increase, they will be 23 per cent above the 2000 level by 2020, or 690 Mt CO<sub>2</sub>-e.<sup>27</sup>

### 1.5.2 Consequences of Action/ Inaction

There is a sizeable uncertainty regarding the possible physical changes to our environment that will result from greenhouse gas (GHG) emissions. While there is a broad consensus that these emissions are driving a rise in global temperatures, the full impact of this remains unclear. According to the Stern Review, the world is already locked in to additional temperature increase of between 0.5 and 1 degree Celsius due to historical emissions.<sup>28</sup>

The Review also forecasts that if emissions continue at current levels, temperatures could rise by two to five degrees by the end of the century. This will have serious ramifications for the Australian environment and economy, including but not limited to a 70 per cent increase in droughts in New South Wales; mass coral bleaching on the Great Barrier Reef; and tropical rainforest in North Queensland reduced by up to 50 per cent.<sup>29</sup>

Transport infrastructure will not be immune to the changing landscape caused by climate change. Operators and planners must increasingly consider the changing intensity and frequency of extreme environmental events as part of decision making. Australia's estimated \$5.6 billion flood bill provides a stark warning that consequences for a changing climate extend far beyond the natural world.

Aside from the severe environmental degradation that will be caused by global warming, Australia must also change its carbon inefficient transport networks due to an overarching economic need. The transport industry is highly exposed to rising fuel prices, costs of congestion and carbon pricing. Passenger transport, regardless of government incentives or international agreements, will face escalating costs for fossil fuel intensive modes.

25 Department of Climate Change and Energy Efficiency, *Australia's Emissions Projections 2010 – Fact Sheet*, Australian Government, Canberra.

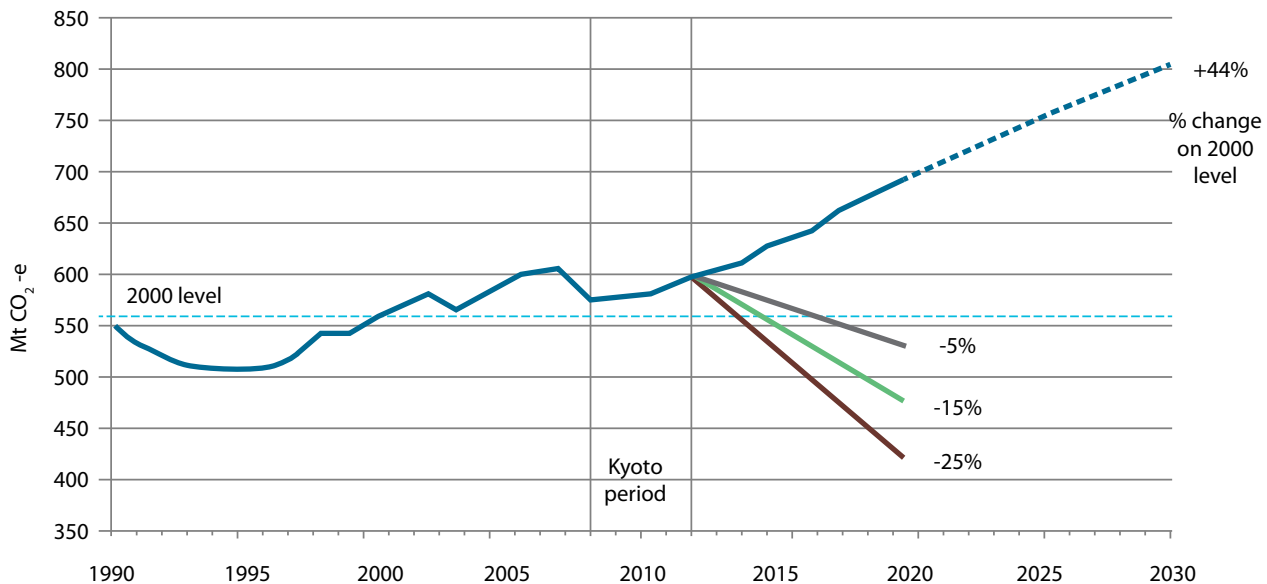
26 Department of Climate Change and Energy Efficiency, *Australia's emissions reduction targets – Fact Sheet*, Australian Government, Canberra, accessed on line at <http://www.climatechange.gov.au/government/reduce/national-targets/factsheet.aspx>

27 Department of Climate Change and Energy Efficiency, *Australia's Emissions Projections 2010 – Fact Sheet*, Australian Government, Canberra.

28 Stern, N, 2006, *Stern Review on the Economics of Climate Change – Executive Summary*, HM Treasury

29 Tourism Transport Forum, 2009, *Responding to Climate Change*, 2009, Tourism and Transport Forum, Sydney.

Figure 1.9: Baseline Transport Sector Emissions Trends 1990 to 2030



Source: Department of Climate Change and Energy Efficiency (2012)

### 1.5.3 The Role of Transport in the Carbon Economy

For Australia to turn around its projected failure to meet emission reduction targets and avoid the consequences of doing so, reform of the transport sector will be vital. Transport is the third largest source of Australia's GHG emissions, accounting for 14.6 per cent of the country's total.<sup>30</sup>

While this is lower as a percentage of emissions than in other developed nations, this is not due to our transport efficiency, but rather the relative inefficiency of our other sectors.

Under a business-as-usual scenario, transport emissions are projected to increase by 20 per cent between 2010 and 2030.

This rise is caused primarily by population and income growth (for passenger travel) and economic growth (for freight transport). This increase will be partially offset by improvements in car efficiency through smaller cars and greater use of biodiesel fuels, as well as the small yet increasing penetration of hybrid cars and motorbikes.

However, the likely impact of this measure on the overall rise of transport emissions will not be substantial.

### 1.5.4 Carbon emissions

How Australians move around in their day to day lives in 2030 will be determined by today's decisions to reduce carbon emissions, and the speed and manner in which Australia realigns to fit with the coming low carbon economy - potentially the biggest revolution in passenger transport since motor vehicles first took to Australia's roads.

The Taskforce believes Australia can best manage this transformation through having a proactive policy agenda that rewards emission reducing initiatives, as well as more accurately valuing the environmental and social benefits of public and active transport.

Unfortunately, this is currently not the case.

Unless dramatic action is taken, Australia will develop viable, low-carbon transport modes far more slowly than economically and environmentally optimal. At present, Australia is expected to significantly overshoot its emissions targets by 2030, tarnishing our international reputation and damaging our fragile environment. A major cause of this has been the ambiguity and continual alteration of successive governments' emission

<sup>30</sup> Tourism Transport Forum, 2009, *Responding to Climate Change*, 2009, Tourism and Transport Forum, Sydney.

reduction agendas. This has stifled and delayed crucial investment in low-carbon transport initiatives across a broad range of industries.

To reverse this trend, government must develop a stronger commitment to emission reductions, sending consistent market signals that will reward early adopters of clean energy. This is particularly important for the transport industry, as the long lead times for infrastructure projects necessitate resolute policy stability.

For Australia to be competitive in the coming low carbon economy, it is vital to:

- > Reduce transport related greenhouse gas emissions and pollution
- > Innovate to improve the fuel efficiency of our existing vehicle fleet and to improve the efficiency of future vehicles
- > Encourage sustainable lifestyle and personal mobility choices
- > Better plan for the integration of new developments and transport infrastructure.

### 1.5.5 Passenger cars

Passenger cars are the largest source of emissions in this sector, accounting for almost half of transport emissions in 2009<sup>31</sup>.

Passenger car emissions are projected to average 41 Mt CO<sub>2</sub>-e per year in the Kyoto period and grow to 44 Mt CO<sub>2</sub>-e by 2020 and remain at similar levels to 2030. (See Figure 1.10)

Passenger car emissions are primarily related to total passenger vehicle kilometres travelled (passenger VKT) and the fuel efficiency of the vehicle fleet.<sup>32</sup>

### 1.5.6 Road transport

Road transport contributes almost 15 per cent of total GHG emissions in Australia.

By 2020, GHG emissions from road transport are predicted to be more than two thirds higher than their 1990 levels, although cars will still account for the majority of road transport emissions.<sup>33</sup> (See Figure 1.11)

### 1.5.7 Reducing Carbon Emissions from Transport

Shifting from cars to public and active transport can deliver a 65 per cent emissions reduction during peak times and a 95 per cent reduction during off peak times.<sup>34</sup>

Transport GHG emissions can be reduced by:<sup>35</sup>

- > Switching car trips to public transport, walking and cycling
- > Reducing the distance people need to travel by locating jobs and essential services closer
- > Mandating emissions reduction targets for new cars in Australia
- > Moving more freight by rail and larger more efficient trucks such as B-Triples in non urban areas.

### 1.5.8 The Role of Public Transport in Reducing Emissions

At current occupancy rates for cars, a full bus can take more than 40 cars off the road, and a full passenger train can take 500 cars off the road.<sup>36</sup>

Based on 2004 occupancy figures for cars and buses, the fuel consumption of buses was 2.5 litres for every 100 passenger km, compared with 7 litres for every 100 passenger km for cars.

31 Barrett and Stanley, 2008, *Moving People: Solutions for a Growing Australia*, ARA, BIC, UITP, Canberra

32 Department of Climate Change and Energy Efficiency, 2010, *Transport Emissions Projections*, Australian Government, Canberra. Accessed online at <http://www.climatechange.gov.au/publications/projections/australias-emissions-projections/transport-emissions.aspx#executive>

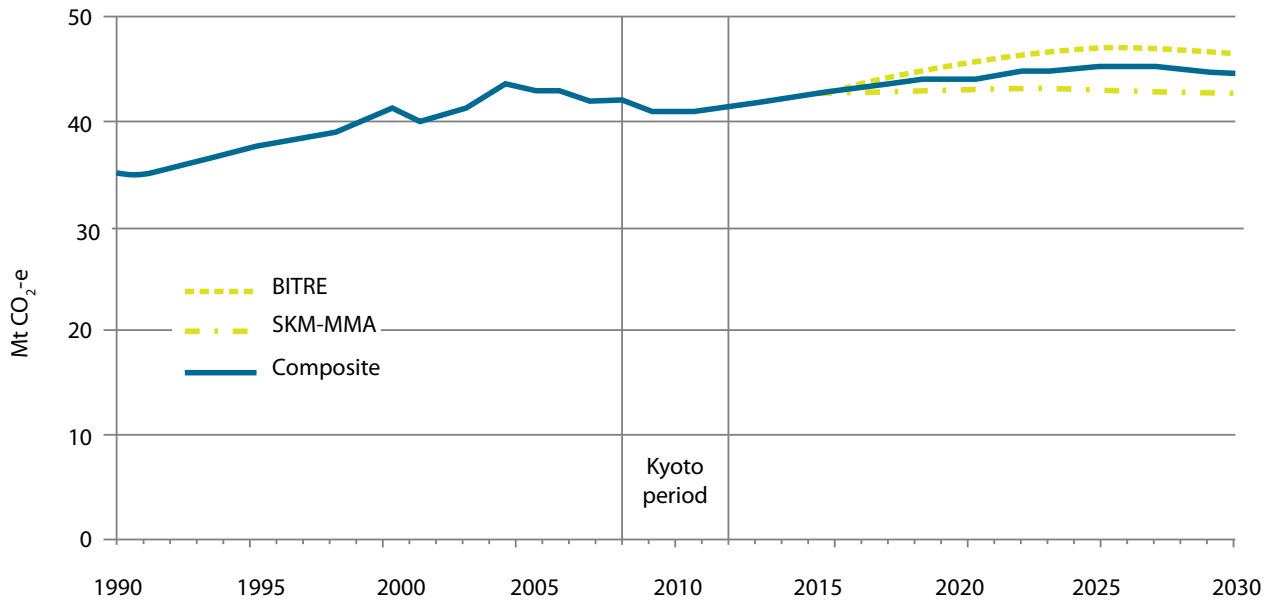
33 Bureau of Infrastructure, Transport and Regional Economics, 2010, *Long Term Projections of Australian Transport Emissions*, Report for the Department of Climate Change and Energy Efficiency, Canberra.

34 Barrett and Stanley, 2008, *Moving People: Solutions for a Growing Australia*, ARA, BIC, UITP, Canberra

35 Barrett and Stanley, 2008, *Moving People: Solutions for a Growing Australia*, ARA, BIC, UITP, Canberra

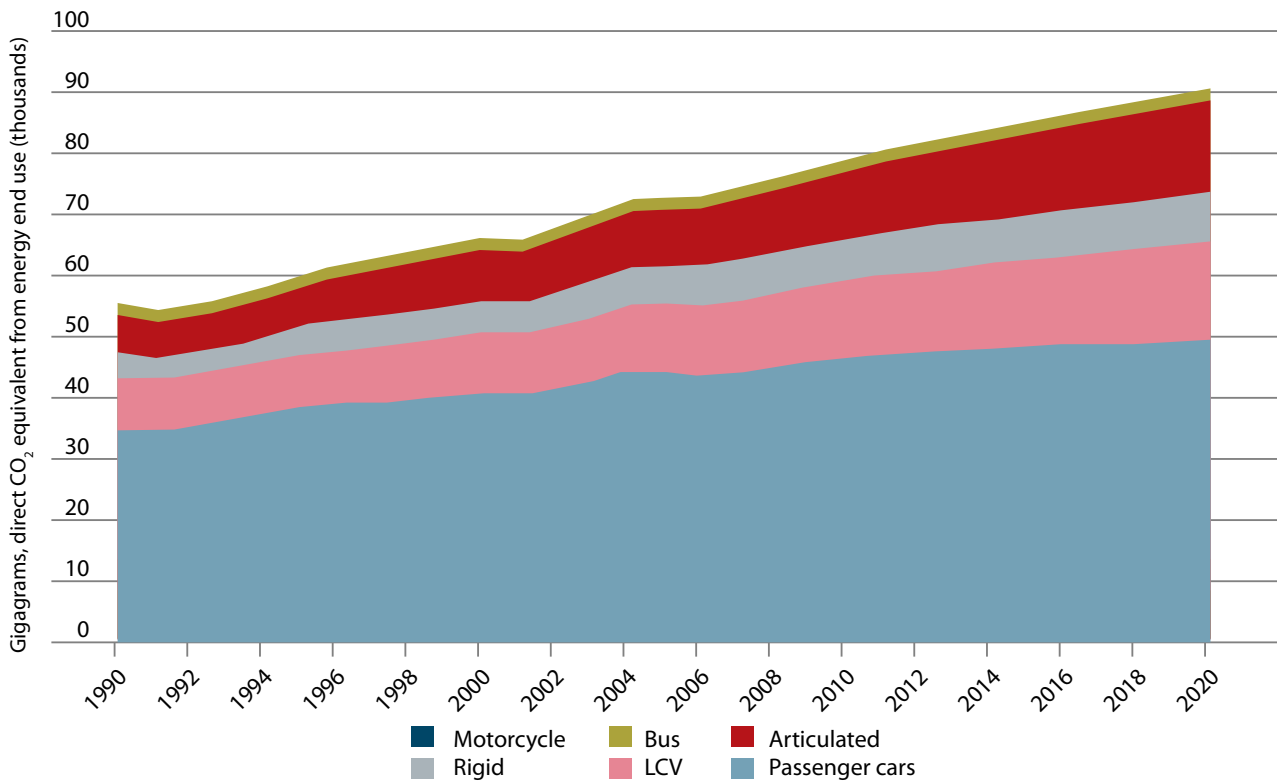
36 Austroads, 2011, *National Performance Indicators*, accessed online at: <http://algin.net/austroads/site/index.asp?id=3>

Figure 1.10: Passenger car emissions, 1990 to 2030



Source: BITRE (2010), SKM-MMA (2010), DCCEE analysis.

Figure 1.11: Greenhouse Gas Emissions Growth for Road Transport



Source: Bureau of Infrastructure, Transport and Regional Economics, 2010



Table 1.3: The Efficacy of Different Measures and Targets in Achieving Reductions in Road Transport GHG Emissions.<sup>37</sup>

Measure	Target	2007	2020 (A)	2020 (B)	2020 (C)
1. Fewer/short car trips (km)	Fewer car km	-	10%	20%	25%
2. Shift car to walking/cycling	Active transport mode share (urban)	16%	26%	34%	39%
3. Increase public transport mode share	PT share or trips (all urban trips)	8%	15%	20%	21%
4. Increase car occupancy	Passengers/car	1.4	1.6	1.8	1.9
5. Freight efficiency	Less fuel than forecast	-	30%	30%	30%
6. Emissions intensity - cars	Less than 2007	-	30%	18%	13%
- trucks	Less than 2007	-	18%	13%	8%

Source: Stanley and Loader, 2008

This means a ten per cent shift to bus passenger transport from cars would reduce GHG emissions by more than 400,000 tonnes a year; every million passenger km on public transport, instead of cars, saves 45,000 litres of fuel.<sup>38</sup>

The emissions savings figures for trains, if extrapolated from the figures delivered for bus by CRA international suggest a ten per cent shift from cars to rail passenger transport could save as much as 4Mt CO<sub>2</sub>-e of emissions a year.

In the long term, reduced dependency on cars will lead to further reductions in emissions from road transport.

The Taskforce sees six key ways by which road transport GHG emissions can be reduced to achieve these targets, and the six could be utilised in many different ways to achieve targets, as illustrated in the following table (options A, B and C all meet the 2020 target).

All sets of measures set out in Table 1.3 require major behavioural and technological changes, particularly early action to redress the lack of progress over the nearly two decades since 1990.

The required policies to achieve these behavioural and technological changes can be summarised in the following nine key actions:

1. Exploration of comprehensive road pricing
2. Increased investment in public transport
3. Major investment in walking and cycling
4. More compact, walkable urban settlements
5. Significantly improved fuel efficiency (mandatory targets)
6. Invest in rail freight and intermodal hubs
7. Freight efficiency improvement (e.g. more productive vehicles; changed delivery times)
8. Reallocate road space to prioritise low emission modes
9. Behaviour change programs.

The Taskforce believes that these are all quite feasible within the 2020 timeframe, provided we act quickly.

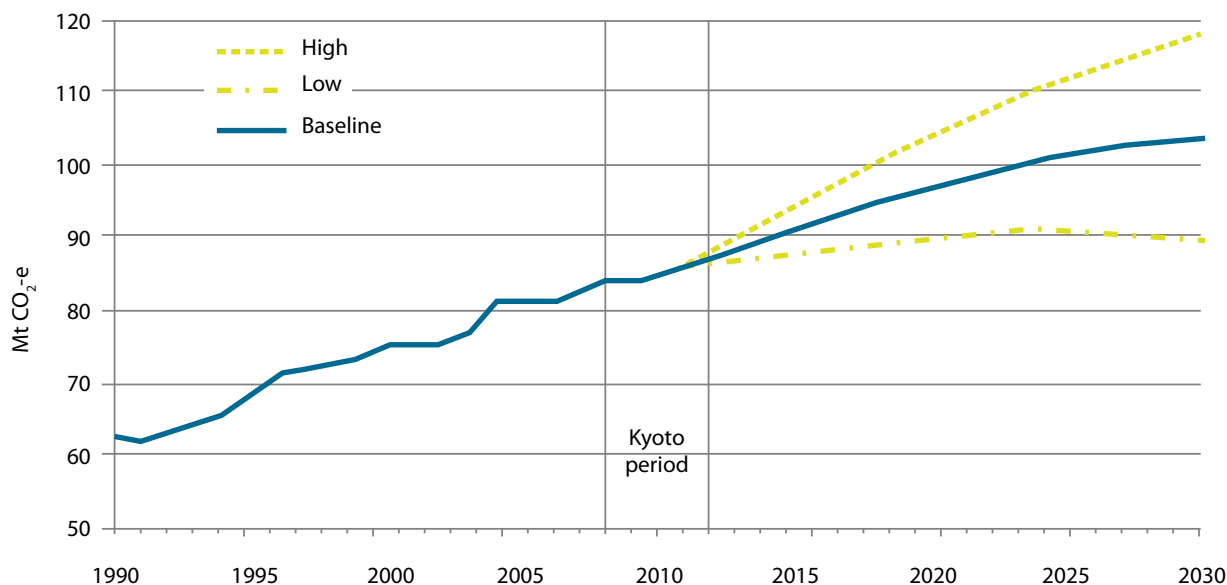
The Taskforce's research indicates that achieving very substantial reductions in vehicle emission intensity is absolutely vital to making major reductions in road transport GHG emissions. We believe that this will require mandatory GHG emissions standards and a focus on changing consumer behaviour towards purchase of less emission intensive vehicles. Through its low scenario Figure 1.12 highlights the potential emissions reductions over time from the introduction of targeted policies.

Many of the emission reduction initiatives considered in

<sup>37</sup> Stanley, J, and Loader, C, 2008, *Stepping off the Greenhouse Gas: Submission to the Garnaut Review*, Bus Association of Victoria, Melbourne.

<sup>38</sup> CRA International, 2006, *Impact on the Australian Economy of Increased Bus Patronage*, Bus Industry Confederation, Kingston, ACT.

Figure 1.12: Transport Emissions Projections to 2030



Source: Department of Climate Change and Energy Efficiency (2012)

this report will benefit from urban development policies and plans that facilitate more compact urban settlement patterns. Such urban design will help to reduce travel distances (e.g. because of closer proximity of trip origins and destinations), make walking and cycling easier and improve the economics of public transport service provision.

The Taskforce has a strong commitment to more sustainable transport networks and fully supports Australia’s commitments to reducing carbon emissions.

One of the major reasons for Australia’s high transport emissions is due to the inefficiency of its car fleet. Average emission levels of EU cars overall are currently 30 per cent lower than that in Australia at 146g/km compared to 210g/km in 2009.<sup>39</sup>

The Australian Government’s decision to implement mandatory carbon emissions standards for new light vehicles from 2015 will lead to a reduction, but this will be coming off a high base. Further, Australia’s old car fleet will mean that any reform will take many years for returns to reach fruition. In 2012, the average age of all registered vehicles in Australia was 10.0 years, an average which has remained stable for the past three

Motor Vehicle Censuses undertaken by the Australian Bureau of Statistics.<sup>40</sup>

### 1.5.9 The Challenge Ahead

Curbing escalating transport sector GHG emissions will be a difficult challenge due to the sector’s heavy reliance on fossil fuels. However, new technologies such as hybrid and electric vehicles, and new infrastructure such as an expanded rail network, provide opportunities to transition successfully to a low carbon future.

To help support this, government must provide a clear, consistent framework that encourages investment and innovation in low-carbon technology as well as disincentives for inefficient operators. If this is done effectively, companies are likely to gain a benefit over competitors by making a faster transition to more sustainable energy.

Managing the public’s impassioned but divided beliefs regarding carbon emission reduction will also present a major challenge. Government policy and consequentially private investment has been dictated by changes in public opinion regarding climate change. It has become abundantly clear that in order for a consistent policy framework to emerge, greater focus on informing and

39 Department of Infrastructure and Transport, (2011) *Light Vehicle CO2 emission standards for Australia*, Discussion Paper

40 Australian Bureau of Statistics, 2012, *Motor Vehicle Census*, Australia, Australian Government, Australia. Accessed online at: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0/>

educating the public will be necessary.

### 1.5.10 Driving Low Carbon Investment

The Australian Government's decision to price carbon emissions from the 2012-13 financial year is an important step in driving sustainable consumer decisions. However, there are currently no measures in place that will serve to motivate commuters to switch to low-emissions transport modes.

Under the current legislation, petrol for private motorists will not be subject to a carbon price, yet public transport fares will, through the application of a price on inputs including electricity and diesel fuel after 2014. In its current form, the carbon price reinforces the modal inequity between private and public transport.

It is important to note that compensation measures will be designed to incorporate price impacts on public transport fares. However, relative to petrol prices, the visible price impact on public transport fares resulting from the carbon tax is likely to drive a mode shift away from public transport. This must be addressed by complimentary measures to provide a price incentive for consumers to choose public transport.

The Taskforce believes that the recommendations presented throughout this report aimed at increasing the mode share of trips to public transport, walking and cycling will reduce the carbon footprint of the transport sector overall.

**Recommendation: Any carbon pricing system to be undertaken by the Australian Government should reflect the environmental and health impacts and benefits of different modes of transport, and include complimentary measures such as investment in encouraging low-carbon transport choices.**

## 1.6 Energy Security

### 1.6.1 Introduction

Transport is the largest consumer of oil, accounting for

almost 70 per cent of Australia's use of oil products.<sup>41</sup>

Australia's current transport fuel self sufficiency level is estimated to be 64 per cent, and this is predicted to remain stable through the uptake of alternative fuels in the event that oil supply becomes limited.<sup>42</sup>

Australia moved from being a net exporter to a net importer of oil in the decade to 2008, and in 2007-08 net imports accounted for almost 30 per cent of total consumption (Figure 1.13).<sup>43</sup>

According to the Australian Government's Australian Energy Resource Assessment, by 2029-30, Australia's collective crude oil and condensate production are projected to fall as older oil fields mature and their productivity gradually diminishes. In the future, Australia may be required to import all its oil, creating a serious energy security risk.

In 2011, Australia's oil production declined by 14.5% compared to the previous year. At the same time, Australia's oil consumption increased by 5.7% (See Figure 1.14).<sup>44</sup>

Continued growth in domestic oil demand and declining domestic oil production are expected to result in a future increase in Australia's oil imports. Given recent trends, the country's self-sufficiency in crude oil and refined petroleum products is likely to drop from 48% in 2011 to approximately 20% by 2020.<sup>45</sup>

There are conflicting views from a range of sources on addressing Australia's future oil self-sufficiency. There is, however, consensus about the need for alternative fuel use in the transport sector as an offset to the variability of oil markets in the future.

It follows that there is an additional need to promote

41 Geoscience Australia & Australian Bureau of Agricultural and Resource Economics, 2012, *Australian Energy Resource Assessment*, Australian Government, Canberra.

42 Graham, P and Smart, A (ACII Tasman), 2011, *Possible Futures, Modelling of Australian Alternative Fuels to 2050*, Australian Government, Canberra

43 Geoscience Australia & Australian Bureau of Agricultural and Resource Economics, 2012, *Australian Energy Resource Assessment*, Australian Government, Canberra.

44 Vivoda, V. 2012, "Australia's Growing Oil Imports are a Security Issue", *The Conversation*, 20 June 2012, accessed online at <http://theconversation.edu.au/australias-growing-oil-imports-are-an-energy-security-issue-7749>

45 Vivoda, V. 2012, "Australia's Growing Oil Imports are a Security Issue", *The Conversation*, 20 June 2012, accessed online at <http://theconversation.edu.au/australias-growing-oil-imports-are-an-energy-security-issue-7749>

Figure 1.13 Australia's Net Oil Imports, Volume and Value

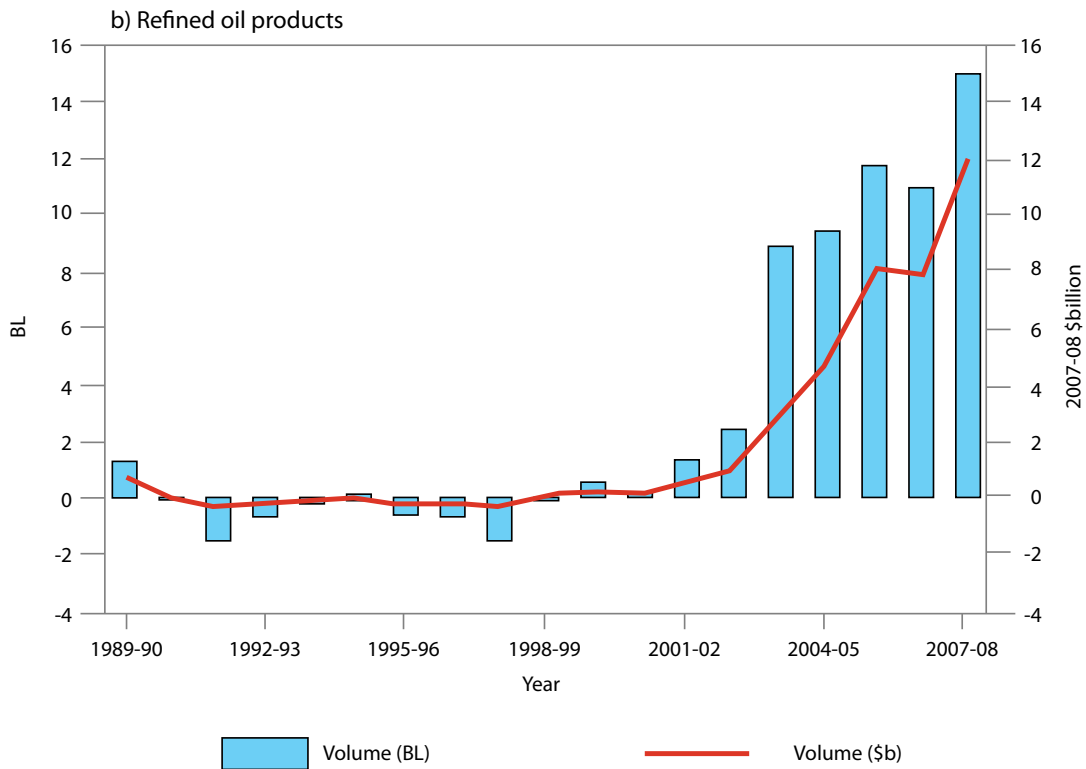
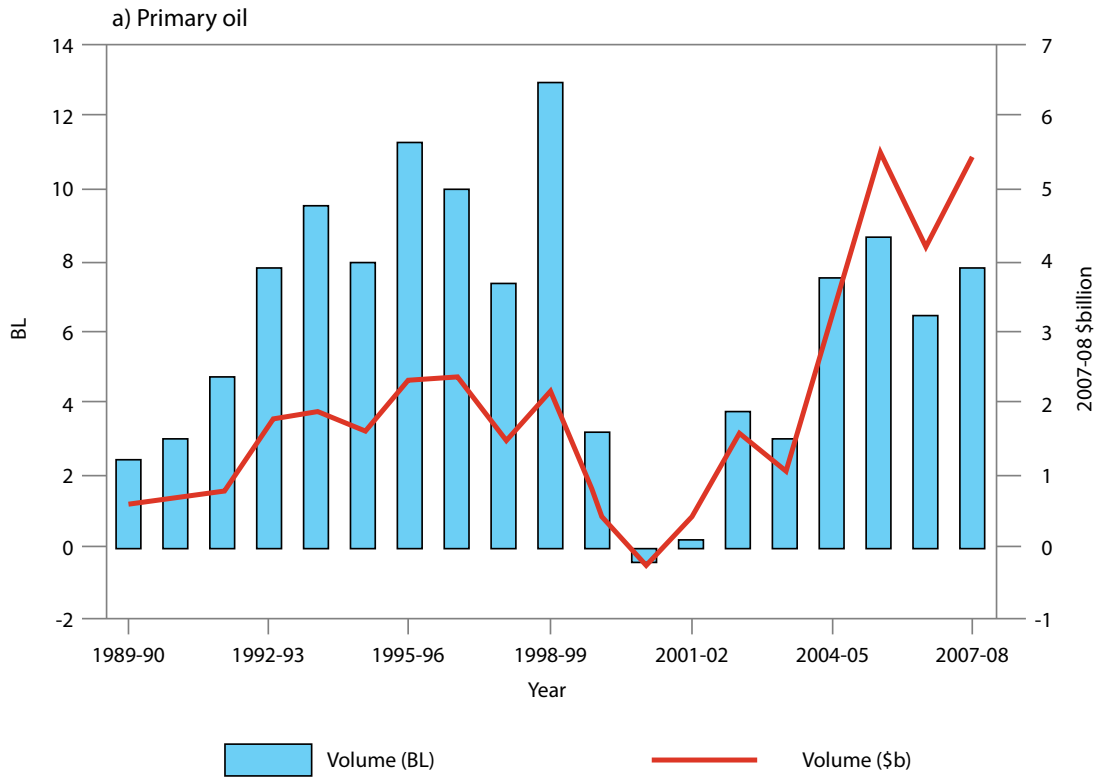
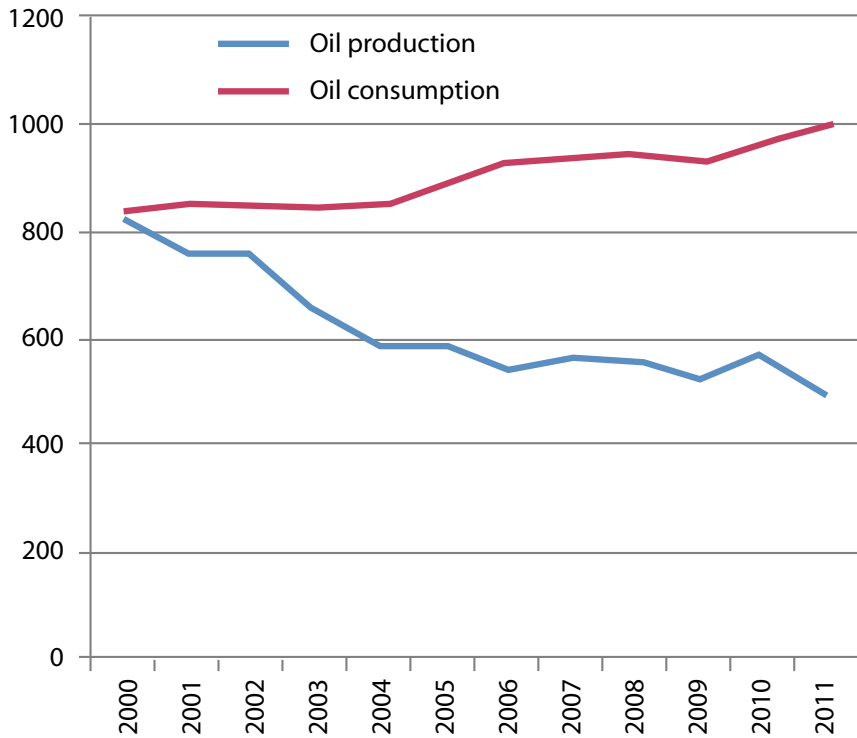
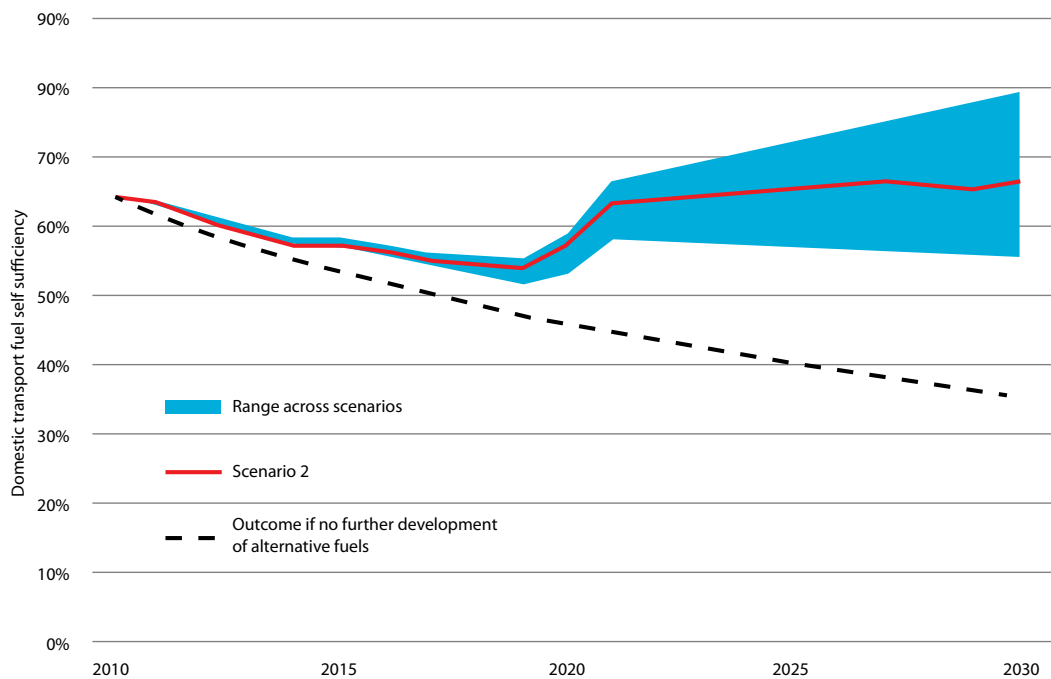


Figure 1.14: Australia's Domestic Oil Production and Consumption Compared 2000-2011



Source: Vivoda, 2012

Figure 1.15: Projected Levels of Transport Fuel Self Sufficiency (Range Across Scenarios)



Source: ACIL Tasman, 2011



alternative and less fuel dependent transport choices, as a means of protecting Australia's fuel self sufficiency.

In undertaking modelling for the Australian Government Department of Resources, Energy and Tourism, ACIL Tasman investigated five possible scenarios for Australian alternative fuels and their relationship to transport fuel self sufficiency to 2050.

Across the five scenarios, transport fuel self sufficiency ranges from 55 to 79 per cent; this modelling is predicated on a high rate of alternative fuel uptake, but also allows for uptake of alternative transportation modes where congestion is a prohibitive factor and where a good range of alternative transport choices exist. If alternative fuels are not developed further the modelling shows a decline in Australia's fuel self sufficiency to as low as 35 per cent (See Figure 1.15).<sup>46</sup>

### 1.6.2 Oil Prices and Living Costs

Transport makes up on average almost 17 per cent of Australian household expenditure (ABS), although this figure varies according to the availability of public transport, walking and cycling.

A significant proportion of Australians living on the fringes of cities are vulnerable to oil price fluctuations and interest rate increases, and they bear a greater burden of the cost of congestion. This trend has been evaluated in Griffith University research which has shown high rates of "forced car ownership", where households are forced to own more than one car due to lack of alternative transport choices.<sup>47</sup>

The VAMPIRE Index produced by Griffith University measured the vulnerability to fuel price increases of residents living in Sydney, Melbourne, Brisbane, Adelaide and Perth based on 2006 ABS Census data.

The research demonstrated the highest rates of vulnerability often occurred in metropolitan and outer-metropolitan areas with the lowest access to public transport, walking and cycling, and the highest levels of car ownership.<sup>48</sup>

### 1.6.3 Public Transport Improves Energy Security

Modal shift can play an important role in improving the energy efficiency of the transport sector as there are currently clear differences in the energy intensity of each travel mode.

Shifts from private car use to public transport (e.g. trains, buses, etc) will have a major impact on energy consumption. A shift to walking or cycling would have even greater benefits on a per km travelled basis.<sup>49</sup>

A range of scenarios for future fuel supply put the average weekly fuel bill for a medium passenger vehicle as high as \$220 (See Figure 1.16).

Capital city average retail petrol prices increased fifty per cent between 2002 and 2008. Diesel prices in Melbourne increased nearly 50 per cent between June 2007 and June 2008.

Increasing public transport patronage levels have been observed in many Australian cities, partly as a response to rising fuel prices.<sup>50</sup> Rising fuel prices are inevitable and future proofing our public transport systems to handle demand driven by the rising cost of fuel is essential. Past fuel price spikes have resulted in some capital city public transport networks being inundated and unable to provide a level of service which retained new customers when fuel price stabilised.

### 1.6.4 Are there Natural Alternatives?

While Australia has a limited supply of crude oil, it does have an abundant supply of Natural Gas. The most recent assessments indicate Australia has some 144 trillion cubic feet of natural gas, well over 100 times the present annual domestic consumption.

A major advantage of utilising natural gas in transportation is the enhancement of Australia's energy security. Utilising locally sourced natural gas as a key fuel in the bus and rail industry can be extremely beneficial to Australia, effectively diversifying fuel risk and increasing control over supply.

46 Graham, P, and Smart, A (ACIL Tasman), 2011, *Possible Futures, Scenario Modeling of Australian Alternative Transport Fuels to 2050*, Department of Resources, Energy and Tourism, Canberra.

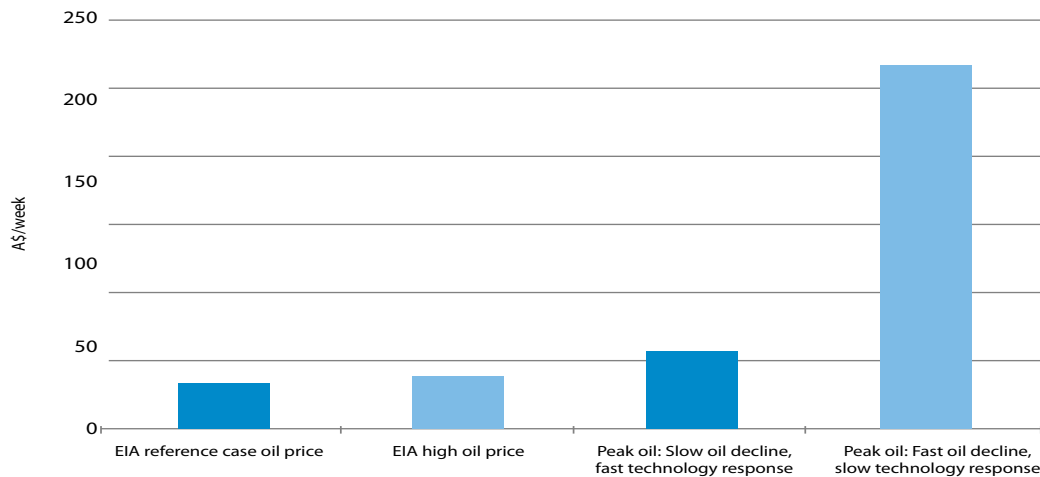
47 Dodson, J and Sipe N, 2006, *Shocking the Suburbs: Urban Location, Housing Debt and Oil Vulnerability in the Australian City*, Urban Research Program Paper number 8, Griffith University.

48 Dodson, J and Sipe N, 2006, *Shocking the Suburbs: Urban Location, Housing Debt and Oil Vulnerability in the Australian City*, Urban Research Program Paper number 8, Griffith University.

49 Heather Haydock and Sujith Kollamthodi, 2009, *Energy Security and the Transport Sector*, Paper produced as part of contract ENV.C.3/SER/2008/0053 between European Commission Directorate-General Environment and AEA Technology plc; accessed online at [www.eutransportghg2050.eu](http://www.eutransportghg2050.eu)

50 Barrett and Stanley (2008), *Moving People: Solutions for a Growing Australia*, ARA, BIC, UITP, Canberra

Figure 1.16: Possible Cost of a Weekly Fuel Bill in 2018 for a Medium Passenger Vehicle Under Alternative International Oil Scenarios <sup>51</sup>



Source: Haydock and Kollamthodi, 2009

This diversification would decrease the risk of fuel shortages due to interruptions to the global diesel petroleum supply chain. Currently some of this risk is managed through Australia's own oil supply, however our supply of accessible crude oil is depleting rapidly.

Low-cost energy is a key component of Australia's current global competitive advantage. Competitively priced power contributes to the ongoing success of key industries such as aluminium, cement, steel, and paper. Due to Australia's size and the geographical spread of population and industry, transport must be as efficient as possible.

The Australian Government has recognised this through its lower than average excise on fuel. Natural gas represents a unique opportunity to reduce costs in the long term and improve the competitiveness of public transport and the freight sector. <sup>51</sup>

**Recommendation: The public transport vehicle fleet to transition to low emissions and high fuel efficiency technology by 2030.**

<sup>51</sup> Heather Haydock and Sujith Kollamthodi, 2009, *Energy Security and the Transport Sector*, Paper produced as part of contract ENV.C.3/SER/2008/0053 between European Commission Directorate-General Environment and AEA Technology plc; accessed online at [www.eutransportghg2050.eu](http://www.eutransportghg2050.eu)



*Perth City Link and Wellington  
Street Bus Station: Reconnecting  
the city and creating new places to  
meet, shop, dine, work and live*



# ***CHAPTER 2***



# OUR TRANSPORT SYSTEM IN 2030: A PROSPEROUS NATION (INFRASTRUCTURE AND CONGESTION)

*Chapter 2 is the first of three chapters devoted to measures and actions to build a prosperous nation. It focuses on the infrastructure challenges facing the transport system in order to achieve our vision for moving people in Australia by 2030.*

*The Taskforce envisions that by 2030 smart investment and management of transport infrastructure will contribute to achieving positive social, economic and environmental outcomes for the nation.*

*To ensure Australia's future prosperity, we need to meet our future transport infrastructure challenges, both in the identification and development of new infrastructure and in the maintenance, use, upgrade and expansion of existing infrastructure.*

## 2.1 Our Infrastructure

### 2.1.1 Falling Behind: Australia's Infrastructure Assessed

Engineers Australia in their 2010 Infrastructure Report Card gave Australia's overall infrastructure a grade of C+, unchanged from 2005.

This grade reflected Engineers Australia's view that infrastructure in Australia was slightly better than "only adequate and in need of major changes", due to long lead times for major infrastructure, slight improvement and slight deterioration in individual infrastructure types.

Of more concern were the grades for road and rail in Australia, which drag down the overall infrastructure grading for Australia.

In 2010, roads were given an overall rating of C, with national roads achieving a C+, state roads C and local roads scoring a worrying D+. Rail, including metropolitan passenger rail, was also given a D+ grade (See Table 2.1).<sup>52</sup>

Reasons identified for the low score for rail include:<sup>53</sup>

- > The need for a high speed rail network along the eastern coast of Australia
- > A lack of access to rail services in major regions and cities, including southeast Queensland and Perth
- > Crowding and congestion on rail lines in Sydney, Melbourne and Brisbane which needs to be addressed by "significant infrastructure and operational improvements"
- > Increasing travel times on some routes, a sign that the infrastructure needs to be upgraded.

The quality of local roads and the infrastructure related to active travel have a significant potential to influence modal choices such as walking and cycling.

In *Going Nowhere: the Rural Roads Crisis, Its National Significance and Proposed Reforms*, the Australian Rural Roads Group estimated the national shortfall on local

52 Engineers Australia, 2010, *Infrastructure Report Card 2010*, Engineers Australia, Canberra (pp 1-5)

53 Engineers Australia, 2010, *Infrastructure Report Card 2010*, Engineers Australia, Canberra (pp 1-5).



Table 2.1: Institution of Engineers’ Infrastructure Report Card Ratings

Infrastructure Type	Aust 2010	Aust 2005	Aust 2001	Aust 1999	ACT 2010	NSW 2010	NT 2010	QLD 2010	SA 2010	TAS 2010	VIC 2010	WA 2010
Roads overall	C	C		C-	B	C-	C	C-	C-	C-	C+	C+
National roads	C+	C+	C	C		B-	B	C-	C	C+	C+	B-
State/Territory roads	C	C	C-	C-		D+	C-	C-	C	C	C+	B-
Local roads	D+	C-	D	D		D+	D+	C-	D	D	C-	C-
Rail	D+	C-	D-	D-	F	D-	C+	C-	C	F	D	C+
Ports	B	C+	B			C	C+	B	B-	B-	C+	B-

Source: Engineers Australia

roads funding at \$2.823b per annum.<sup>54</sup>

Work undertaken by Price Waterhouse Coopers for the Australian Local Government Association came close to this figure, with an estimated funding gap of between \$1.8b and \$2.3b per annum.<sup>55</sup>

Engineers Australia’s grading of infrastructure is corroborated by international rankings from the World Economic Forum, who identify Australia as underperforming in the area of infrastructure, with a ranking of 37th in the world in 2011 for overall infrastructure, behind countries such as Namibia and Barbados.

Our road infrastructure scored slightly better at 34th in the world, but still behind countries including Lithuania, Namibia and Barbados.<sup>56</sup>

### 2.1.2 Infrastructure Challenges and Infrastructure Australia

The Taskforce believes establishment of Infrastructure Australia by the Australian Government was a positive and needed step towards addressing our infrastructure challenges in the future.

The Taskforce, in undertaking a review of how infrastructure is assessed and consequentially funded, has identified that the definition of “national significance” under the Building Australian Fund evaluation criteria is too narrow.

The Taskforce believes “national significance” needs to take into account the importance of our cities and regions to the national economy, and the national cost of social and environmental externalities such as congestion, even when it is experienced at a local level.

It is for this reason that the Taskforce calls for greater differentiation in the way governments treat different types of infrastructure, and supports the development of Moving People Infrastructure criteria for assessing all land transport infrastructure bids.

**Recommendation: Develop a set of Moving People Infrastructure criteria for all Australian Government funded transport infrastructure projects that:**

- > Recognise the value of small to medium scale public and active transport infrastructure
- > Facilitate an objective assessment of all benefits associated with these projects
- > Recognise the impacts of freight and non-transport related infrastructure investment on public and active transport infrastructure.

The Taskforce supports the advisory work being undertaken by Infrastructure Australia, and believes there is scope for Infrastructure Australia to address a number of gaps not only in nationally significant infrastructure development, but also small to medium scale local infrastructure projects.

As Infrastructure Australia stated in its 2012 report to COAG, these smaller scale projects, if built within a framework of strong strategic planning principles, have the potential to improve the liveability and viability of our major cities, towns and regions.<sup>57</sup>

54 Australian Rural Roads Group, 2010, *Going Nowhere: The Rural Roads Crisis Its National Significance and Proposed Reforms*, Prepared for Infrastructure Australia, Australian Government, Canberra.

55 Access Economics and Municipal Association of Victoria research as summarised in Price Waterhouse Coopers report, 2006, *National Financial Sustainability Study of Local Government* – report prepared for the Australian Local Government Association Table E.2 p. 11.

56 World Economic Forum, 2011, *The Global Competitiveness Report*.

57 Infrastructure Australia, 2012, *Progress and Action, June 2012 Report to the Council of Australian Governments*, Australian Government Canberra.

In its 2012 report to COAG, Infrastructure Australia identified the following key challenges for infrastructure:<sup>58</sup>

- > Weaknesses in strategic planning
- > Funding constraints
- > Other inefficiencies in infrastructure markets and the use of infrastructure.

This followed from the 2011 report to COAG, which identified four key infrastructure challenges:

- > A decline in the rate of national productivity growth, and uncertain prospects for future improvements in productivity
- > The failure of government to lead a community debate and reach agreement on necessary changes in the way the nation funds the development and operation of our key infrastructure, especially in the transport sector
- > Slow progress in pursuing regulatory reform, including limited progress in implementing reforms that governments have already agreed, for example in the water sector
- > Continuing weakness in the planning of our infrastructure networks and in infrastructure investment decisions.<sup>59</sup>

The challenges identified by Infrastructure Australia are echoed in the work undertaken by several bodies, including Engineers Australia and Infrastructure Partnerships Australia.

### 2.1.3 The Moving People Task in 2030: Why Moving People Infrastructure is Critical

The decade 2001 – 2010 saw significant increases in demand for public transport across Australia.

Between 1977 and 2010 urban public transport grew by at an annual 1.96 per cent from 10.1 billion passenger

kilometres in 1977 to 19.1 billion in 2010, a near-doubling over the three decades.<sup>60</sup>

Even faster growth was experienced from 2001 to 2010, when the urban public transport task grew at an average of 2.57 per cent per annum, significantly outstripping population growth of 1.58 per cent per annum.

This rapid growth also led to an increase in the modal share of passenger trips for urban public transport from 9.8 per cent to 10.9 per cent.<sup>61</sup>

Figure 2.1 demonstrates the significant growth in public transport patronage that has been seen in Southeast Queensland, Melbourne and Perth with slight decreases in other capitals.

The growth experienced in the three decades to 2010 is predicted by BITRE to continue to 2030, albeit at a lower rate than experienced in 1977-2010.

Between 2011 and 2030, the total urban public transport task is forecast by BITRE to grow from 19.59 billion passenger km to 25.28 billion passenger km, an average annual growth rate of 1.35 per cent (See Figure 2.2).<sup>62</sup>

While the rate of growth is predicted to be slower, as a proportion of pre-existing levels, the growth outlined in figure 2.3 represents a growth in the urban public transport task of almost 33 per cent of 2010 levels.

A key driver of this growth is identified by BITRE as the population growth in our capital cities.

In addition to predicted growth in the public transport task in Australia's capital cities, other major cities such as the Gold Coast, Newcastle and Wollongong, which were not included in the BITRE analysis, will drive added demand for public transport services.

The dispersal of population growth to these non-capital major cities is expected to be significant.

For example the Gold Coast, with a population of

<sup>58</sup> Infrastructure Australia, 2012, *Progress and Action, June 2012 Report to the Council of Australian Governments*, Australian Government Canberra.

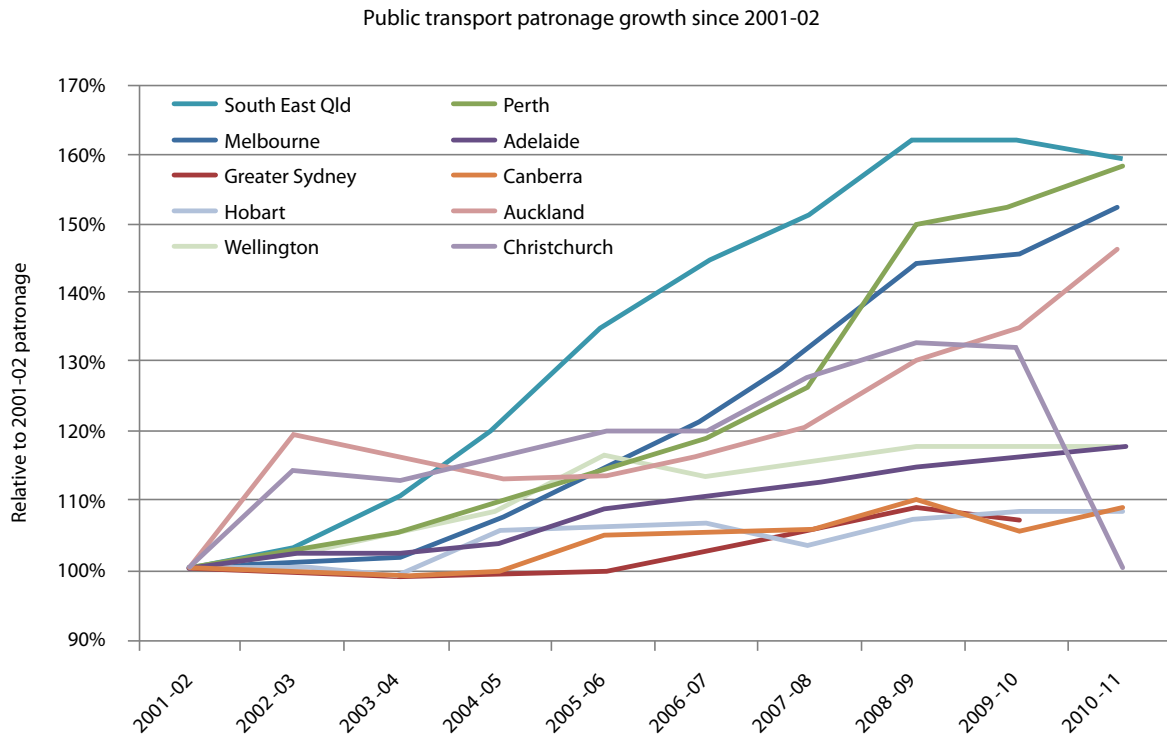
<sup>59</sup> Infrastructure Australia, 2011, *Communicating the Imperative for Action – A Report to the Council of Australian Governments*. Australian Government, Canberra.

<sup>60</sup> Gargett, D, and Hossain, A. 2012, *Public Transport Use in Australia's Capital Cities: Modelling and Forecasting*, ATRF 2012 Proceedings, Bureau of Infrastructure, Transport and Regional Economics.

<sup>61</sup> Gargett, D, and Hossain, A. 2012, *Public Transport Use in Australia's Capital Cities: Modelling and Forecasting*, ATRF 2012 Proceedings, Bureau of Infrastructure, Transport and Regional Economics.

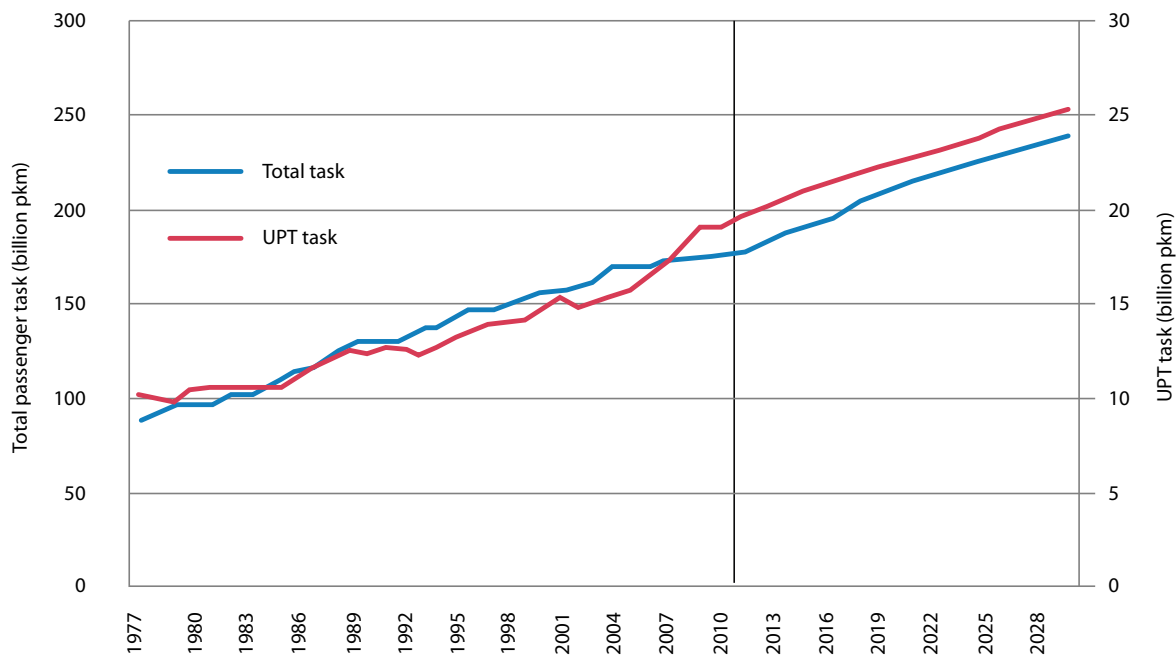
<sup>62</sup> Gargett, D, and Hossain, A. 2012. *Public Transport Use in Australia's Capital Cities: Modelling and Forecasting*, ATRF 2012 Proceedings, Bureau of Infrastructure, Transport and Regional Economics.

Figure 2.1: Public Transport Patronage Growth since 2001-2



Source: Charting Transport, <http://chartingtransport.com/2010/07/04/pt-mode-shift-and-congestion/>

Figure 2.2: Total Passenger and Urban Passenger Transport Task for Australian Capital Cities 1977 - 2030



Source: BITRE, 2012

approximately 450,000 in 2011<sup>63</sup>, is predicted to double its population to almost 900,000 by 2030.<sup>64</sup> Some estimates have this figure as high as one million by 2027.<sup>65</sup>

Disturbingly, the urban public transport task as a share of the total passenger task in capital cities is forecast to decline slightly, rather than growing: from 11.1 per cent in 2011 to 10.6 per cent in 2030.<sup>66</sup>

*The Taskforce sees modal share forecasts as a serious concern for the future state of our cities and their liveability. Based solely on current congestion levels in cities such as Sydney, Melbourne and Brisbane the Taskforce believes Australia runs the risk of our capital and major cities grinding to a standstill.*

While public transport has grown strongly, participation in cycling has remained at insignificant levels in most areas at around 1.5% of all trips to work nationally. Walking remains an important but largely ignored mode in planning for moving people.

A national survey found 60% of Australians have access to a bicycle, but 70% of respondents were not considering cycling for transport in the near future. More than half (52%) of those respondents would like to be able to ride for transport.

Respondents were likely to cite factors related to cycling infrastructure—unsafe road condition, speed/volume of traffic, lack of bicycle lanes and safety—as key reasons for not cycling often.

The majority of respondents (over 80%) agreed that paved paths along roads physically separated from motor traffic and paved separated trails along rivers and scenic areas would encourage them to ride more than they do.<sup>67</sup>

The ACT (Canberra) has one of the largest networks of on-road lanes and off road shared paths, and also the highest mode share of bicycle trips to work as the main form of travel (See Figure 2.3).<sup>68</sup>

Factors that influence walking and riding include the provision of direct and continuous routes (infrastructure) between key local places<sup>69</sup>. While many factors contribute to increasing the numbers of people who walk and cycle—planning, density, appropriate infrastructure—dedicated infrastructure suitably prioritised for use by either pedestrians or cyclists is vital to encourage substantial increases in those modes.

Since 2007 New York City has installed more than 430km of bike lanes, and the number of New Yorkers riding to work and school has doubled. Prioritising space in the centre of the city around Times Square saw increases in pedestrian traffic, a 35% reduction in pedestrian injuries, and other benefits including improved traffic flow and a transformation in the value of the retail precinct, where rents doubled despite the global financial crisis.

Delivering improved environments and infrastructure, including prioritising walking and cycling to improve access, amenity and safety for users of those modes, are critically important to realising the benefits for all users of the transport system.

Investment in infrastructure that prioritises walking, cycling and public transport and the planning systems and guidelines to support those decisions is critical if the congestion, health, environmental and social amenity benefits of increases in their mode share are to be realised.

*Recommendation: Infrastructure for active travel and integrated rapid transit systems is prioritised in federal and state funding programs for identified corridors.*

As the costs of owning and driving cars continues to increase, urban public transport and active transport modes such as walking and cycling have a significant role to play in addressing demand for transport.

63 Australian Bureau of Statistics, 2011, *Regional Population Growth Australia*, Australian Government Canberra.

64 Office of Economic and Statistical Research, 2012, *Population and Dwelling Profile*, Gold Coast City Council, Queensland.

65 *Gold Coast News*, accessed online at [http://www.goldcoast.com.au/article/2008/09/24/16678\\_gold-coast-news.html](http://www.goldcoast.com.au/article/2008/09/24/16678_gold-coast-news.html)

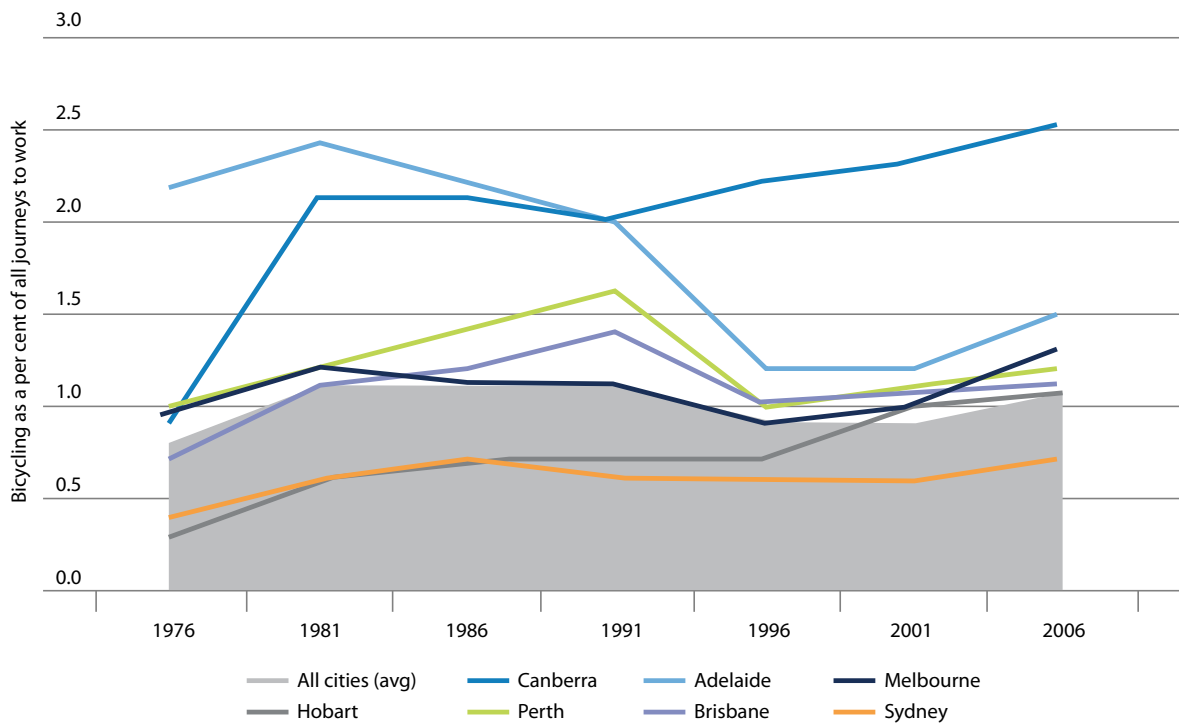
66 Gargett, D, and Hossain, A. 2012. *Public Transport Use in Australia's Capital Cities: Modelling and Forecasting*, ATRF 2012 Proceedings, Bureau of Infrastructure, Transport and Regional Economics.

67 National Heart Foundation and Cycling Promotion Fund, 2012, *Riding a Bike for Transport: 2011 Survey Findings*.

68 Department of Infrastructure and Transport, *Walking, Riding and Access to Public Transport*, Australian Government, Canberra, p38.

69 Department of Infrastructure and Transport, *Walking, Riding and Access to Public Transport*, Australian Government, Canberra, p43.

Figure 2.3: Bicycling in Capital Cities as a Percentage of all Trips to Work, 1976-2006



Source: Department of Infrastructure and Transport, 2012

A possible explanation for this slowdown in growth is a “peak car phenomenon” observed by a number of researchers and examined by Newman and Kenworthy, which may be driving down growth in demand for passenger trips as a result of a number of factors including rising fuel prices and increasing urban density.<sup>70</sup>

In *Moving People: Solutions for a Liveable Australia*, Stanley states:

“... growth in car traffic has slowed in recent years, to the point where future growth will mainly be associated with population growth although major new additions to road space in coming years will generate new growth and must be carefully planned, in view of the continuing levels of externalities...”

What Stanley observes is that while car traffic growth has slowed, there is a danger that underinvestment

in public and active transport infrastructure will cause modal share of passenger trips to shift to non-sustainable forms of transport.

As identified previously there is a need for increased investment in moving people infrastructure and assessment processes; however a higher priority in the first instance is to identify opportunities for more efficient use of existing transport infrastructure to reverse this predicted decline in public transport modal share by 2030.

This could be done through the introduction of a State by State ‘Better Use’ research program for existing public transport, walking and cycling infrastructure.

The scope of such a research project should be to identify opportunities for more efficient operation, increased service levels and value in public and active transport infrastructure.

<sup>70</sup> Newman, P, and Kenworthy J, 2011, *Peak Car Use: Understanding the Demise of Automobile Dependence*, World Transport, Policy and Practice.

**Recommendation:** *The introduction of a State by State 'Better Use' research program for existing public transport, walking and cycling infrastructure.*

## 2.2 Decongesting Our Economy: Putting a Price on Congestion

### 2.2.1 The Cost of Congestion

Traffic congestion is a major obstacle to growth in the economy, damages the environment, and reduces the quality of life of Australians living in major cities.

Traffic congestion is forecast to cost the Australian economy \$20 billion in lost revenue by 2020.<sup>71</sup> In a "business-as-usual" scenario, the cost of congestion will continue to grow to 2030 as the amount of passenger vehicle km travelled in cars increases.

The annual costs of congestion by 2015 are estimated to be in the thousands of dollars per capita for residents of Australia's capital cities (See Table 2.2), with Brisbane the most expensive city in congestion terms at \$4600 per capita. The cost per family per annum in Brisbane is estimated at \$12,000.

Table 2.2: Congestion Costs Per Capita in Australia's Capital Cities, Comparing 1995 to Forecasts For 2015

City	Congestion Cost Per Capita (1995) \$ AUD	Congestion Costs Per Capita (2015) \$ AUD
Sydney	1600	2000
Melbourne	840	2100
Brisbane	1800	4600
Adelaide	740	1500
Perth	480	1900
Average Across Capitals	1004	2420

Source: Bureau of Transport and Economics, 1999

71 Bureau of Infrastructure Transport and Regional Economics, Working Paper 71: *Estimating Urban Traffic and Congestion Cost Trends for Australian Cities*, Australian Government, Canberra.

### 2.3.2 A Congested 2030?

If significant changes are not made to the way Australians travel, congestion will be worse, and cost the economy even more in 2030 than it does now.

According to the Department of Climate Change and Energy Efficiency (DCCEE), between 2010 and 2020 passenger vehicle kilometres travelled (passenger VKT) are forecast to increase at an average 1.8 per cent per year.

This is slightly lower than the average annual growth of around 1.9 per cent experienced between 1990 and 2004, yet significantly higher than the average fall of around 0.3 per cent per year experienced between 2004 and 2009 when high oil prices and the global financial crisis were felt.

The primary drivers for passenger VKT are population growth and per capita travel, which in turn is largely driven by income. The dominant driver of the future increase in passenger VKT is population growth. Population is forecast to increase steadily over the projection period at an average 1.4 per cent between 2010 and 2020 and 1.3 per cent between 2020 and 2030.<sup>72</sup>

Per capita travel is projected to increase again due to the economic recovery. As income levels and motor vehicle affordability increase over time, average travel per person will also increase. It is also projected that Australia will approach a saturation level near which per capita VKT will become increasingly decoupled from per capita income growth. (See Figures 2.4 and 2.5)

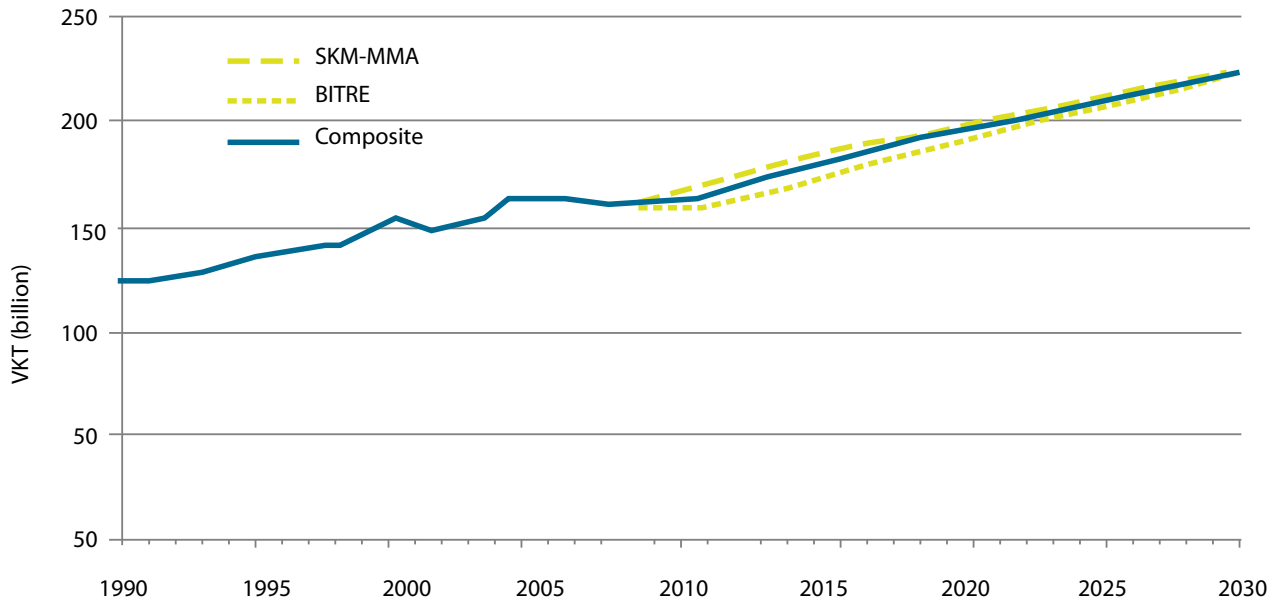
This is essentially because people will eventually be able to spend as much time on daily travel as they are prepared to commit, and this will not increase even if incomes do rise further.<sup>73</sup>

72 Department of Climate Change and Energy Efficiency, 2012, *Transport Emissions Projections*, accessed online at <http://www.climatechange.gov.au/publications/projections/australias-emissions-projections/transport-emissions.aspx>

73 Department of Climate Change and Energy Efficiency, 2012, *Transport Emissions Projections*, accessed online at <http://www.climatechange.gov.au/publications/projections/australias-emissions-projections/transport-emissions.aspx>

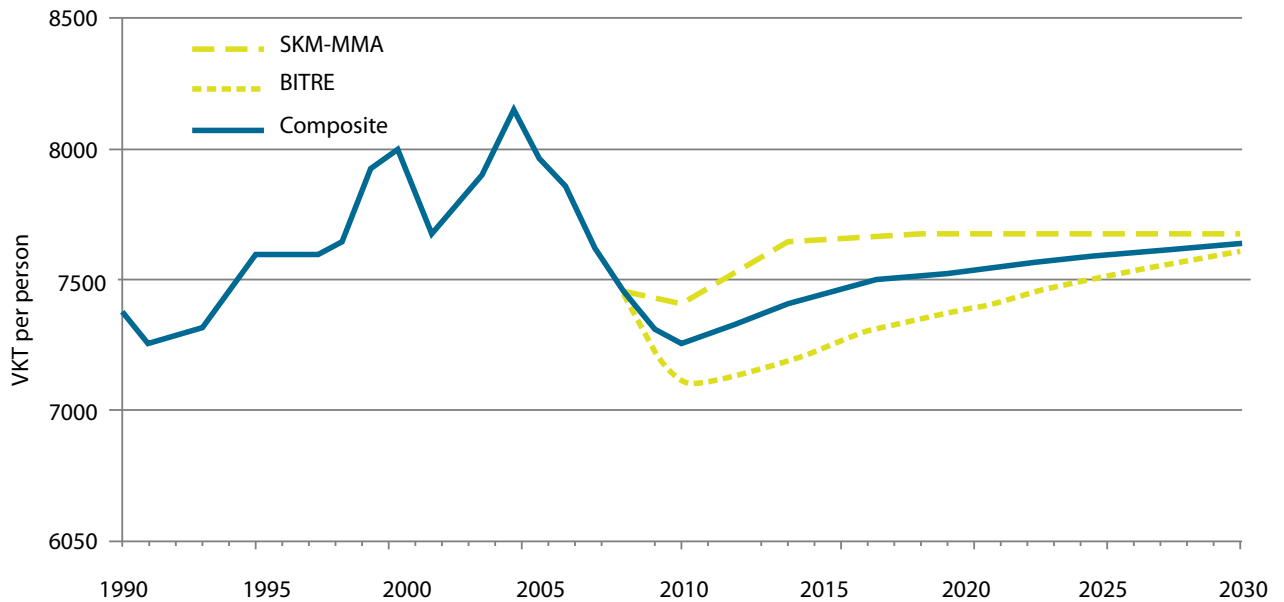


Figure 2.4: Passenger Car Vehicle Kilometres Travelled (VKT), 1990 to 2030



Source: BITRE (2010), SKM-MMA (2010), DCCEE analysis.

Figure 2.5: Passenger Car Vehicle Kilometres Travelled (VKT) per person, 1990 to 2030



Source: BITRE (2010), SKM-MMA (2010), DCCEE analysis.

### 2.2.3 Examples of Congestion Charging

A charging system that varies by traffic levels, usually determined by hours of use, can be classified as a congestion charging system.

Definitions can vary, but most commonly forms of congestion charging include cordon,<sup>74</sup> area or zone, multi-road charges, and corridor or facility charges.<sup>75</sup>

The most commonly proposed and implemented form of congestion pricing is a cordon charging scheme,<sup>76</sup> which is used in cities including Singapore, Stockholm in Sweden, and Milan in Italy.<sup>77</sup> Cordon area schemes charge motorists a fee to enter a designated or cordoned area.<sup>78</sup>

A cordon charging system in the Australian environment could work on number plate recognition, similarly to the e-tag system in Sydney.

Hensher has identified limitations to the application of cordon charging systems in Australian cities, which will be investigated further in this section of the report.<sup>79</sup>

Area or zone schemes charge drivers travelling into, out of and within a designated charging area. According to some definitions of area pricing schemes,<sup>80</sup> London is the prime example of an area or zone congestion charging scheme. The London scheme uses number plate recognition cameras and charges a fee based on users crossing pre-determined boundaries.

Multi-road congestion charges can employ variable tolling when users pass designated tolling points.<sup>81</sup> The most comprehensive multi road congestion charging system is in place in Singapore.

Facility or corridor charging is levied on users moving

along a specific roadway;<sup>82</sup> tolls are variable along these routes, depending on the rate of traffic flow or congestion along the route.<sup>83</sup> The Sydney Harbour Bridge is an example of variable tolling employed in a single facility.<sup>84</sup>

### 2.2.4 Congestion Charging: A Pricing Solution?

Congestion charging in our major cities remains a contentious issue within the community.

Currently, most taxes on motor vehicles and motor vehicle fuels are designed for general revenue raising, not to change a motorist's driving decisions.

A congestion pricing system introduced in any major city in Australia would represent a significant shift in the way governments and the community think about pricing our transport network.

The introduction of a congestion pricing system would present a political challenge, but not an insurmountable challenge: congestion charging has been introduced in other cities. An example of this identified by Ingles in his 2009 paper is London, where an increase in the initial charge equivalent to AUD\$6 had some degree of support after two years of the scheme being in operation.<sup>85</sup>

The basis of a congestion pricing trial has been put in place through an inter-governmental agreement in 2008.

As Ingles notes, Ministers for the Australian Transport Council (now the Standing Committee on Transport and Infrastructure) agreed in 2008 that "jurisdictions will cooperate in modelling the congestion, network, socio-economic and emissions outcomes of various targeted pricing scenarios."<sup>86</sup>

A paper developed for Infrastructure Australia by Deloitte identified key factors in the political success of any congestion pricing scheme as transparency,

74 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

75 Infrastructure Australia, *The High Cost of Free Roads: The Case for Congestion Pricing in Australia*, Australian Government, Canberra.

76 Synergies Economic Consulting, 2005, *Congestion pricing for Brisbane*.

77 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

78 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

79 Hensher, D, and Mulley, C, 2012, *Getting started with road pricing reform: what may appeal to politicians and citizens?* Institute of Transport and Logistics Studies, The University of Sydney Business School, Sydney.

80 Deloitte, 2010 paper for Infrastructure Australia

81 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

82 Bureau of Infrastructure, Transport and Regional Economics, 2008, *Moving urban Australia: can congestion charging unclog our roads?* Working Paper 74. Australian Government, Canberra. Accessed online at: [www.bitre.gov.au/publications/80/Files/WP74.pdf](http://www.bitre.gov.au/publications/80/Files/WP74.pdf)

83 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

84 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

85 Ingles D, 2009, *Road Congestion Charges: An Idea Whose Time Has Come*, Australian Institute, Canberra.

86 Australian Transport Council, 2008, *Communiqué following ATC Meeting*, Australian Government Canberra.

accountability and the use of revenue.<sup>87</sup> Singapore's aim for revenue neutrality through the use of charging revenue to reduce other motoring related expenses is identified as important to its political viability.<sup>88</sup>

The London cordon area scheme is identified as a political success in the sense that it didn't bring down the government who implemented it. BITRE identifies community attitudes to the proposed scheme as vital in the political success of any scheme, and the use of revenue from charging as underpinning community support.<sup>89</sup>

A hurdle, both politically and socially, is the impact of congestion pricing on equity, potentially penalising low-income motorists, who can least afford it.

For example, outer metropolitan residents of our cities rely on their vehicles for access to employment and education due to a lack of viable alternatives at their point of origin. There is evidence to suggest that these motorists already expend the highest proportion of household income on fuel taxes and compulsory road charges, including vehicle registration and tolls. (See Figure 2.6)

For a congestion pricing system to be politically and operationally successful, due consideration would need to be given to social equity issues and the practicability of the approach in the Australian urban environment.

Any congestion pricing system would also have to consider the treatment of delivery and trade vehicles, and the impact on the cost of operating a business.

This is addressed, to some extent, in the examples of congestion charging examined in this section.

Another obstacle to the implementation of congestion pricing commonly identified by opponents of the idea is a lack of viable public transport as an alternative to driving into cities.

The Taskforce believes a key factor in achieving equitable outcomes from congestion pricing is the

investment of revenue from any such scheme in better mobility options, including public transport, walk ability initiatives and cycle paths. This must be clearly communicated to the public to obtain any level of acceptance.

The Taskforce believes congestion charging should be explored as an important facet of a wider, comprehensive road pricing system that reflects the true costs of transport choices.

A comprehensive road pricing system is an essential basis for funding our transport infrastructure needs in the future and ensuring Australia continues to build on its prosperity in 2030.

In Recommendation 61, the Henry Review of Australia's Future Tax System called for Governments to "analyse the potential network-wide benefits and costs of introducing variable congestion pricing on existing tolled roads (or lanes), and consider extending existing technology across heavily congested parts of the road network."

The Moving People 2030 Taskforce supports this recommendation, and would support the Australian Transport Council agreement of 2008 being progressed in the form of congestion pricing trials in capital and major cities, as agreed by the Standing Committee on Transport and Infrastructure.

## 2.2.5 Where has Congestion Charging Worked?

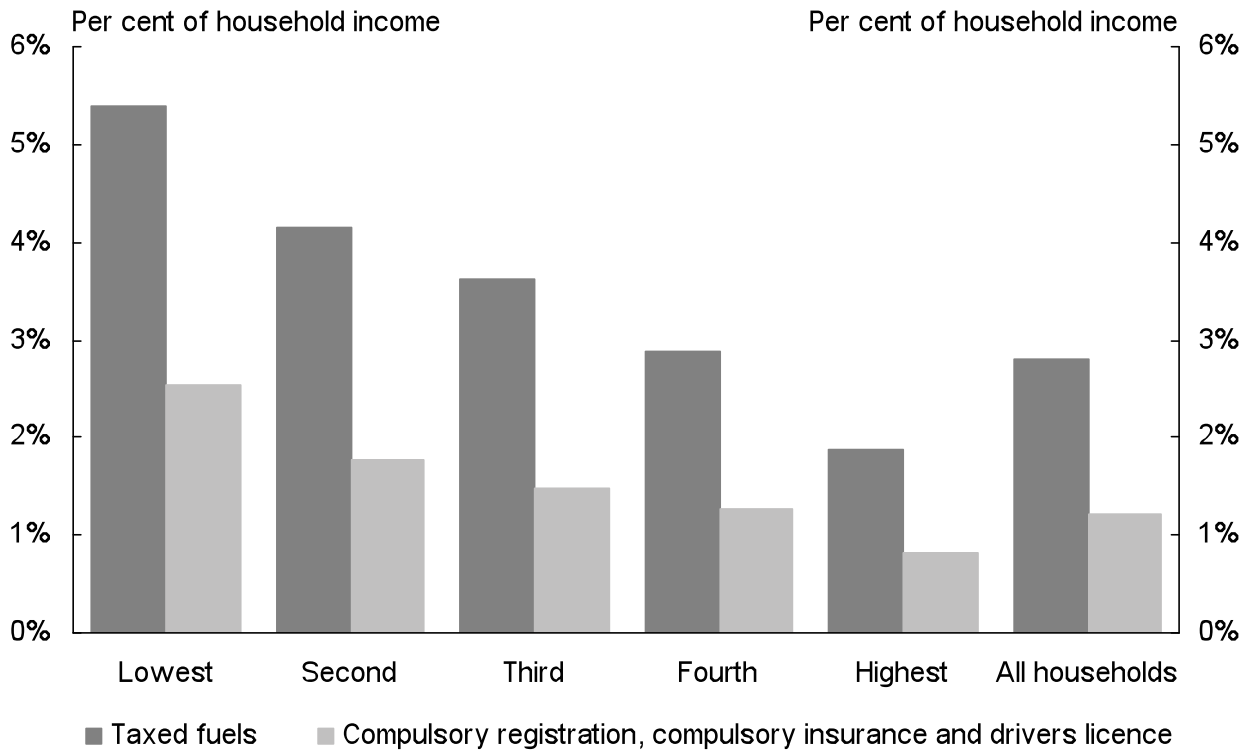
Table 2.3 outlines the outcomes of implemented congestion charging schemes against stated objectives of the scheme.

87 Deloitte, 2011, *Road Pricing Necessity or Nirvana*, accessed online at: [http://www.deloitte.com/view/en\\_au/au/5dd82aa7c3322310VgnVCM2000001b56f00aRCRD.htm](http://www.deloitte.com/view/en_au/au/5dd82aa7c3322310VgnVCM2000001b56f00aRCRD.htm)

88 Deloitte, 2011, *Road Pricing Necessity or Nirvana*, accessed online at: [http://www.deloitte.com/view/en\\_au/au/5dd82aa7c3322310VgnVCM2000001b56f00aRCRD.htm](http://www.deloitte.com/view/en_au/au/5dd82aa7c3322310VgnVCM2000001b56f00aRCRD.htm)

89 Bureau of Infrastructure, Transport and Regional Economics, 2008, *Moving Urban Australia: can congestion charging unclog our roads?* Working Paper 74. Australian Government, Canberra.

Figure 2.6: Household Expenditure on Taxed Fuels and Compulsory Road Charges by Gross Household Income Quintile



Source: Australian Bureau of Statistics, Household Expenditure Survey, Australia, 2003-04



Table 2.3: Congestion Charging Schemes in Operation and Outcomes Achieved

<b>Scheme Type and Location</b>	<b>Stated Objective</b>	<b>Response</b>
<b>Cordon</b>		
Singapore 1975 Area Licence 1998 Electronic Congestion Pricing	Reduce congestion; maintenance of travel speeds	13 per cent fall in traffic
Stockholm 2006	Reduce congestion, improve environment and fund public transport	20 per cent fall in traffic
Trondheim 1991 initiated 1998 expanded to time of day pricing 2005 pricing scrapped	Originally to finance new infrastructure, then to manage congestion	Met the financial goals and then reduced congestion by 5 per cent. Scheme was stopped but now there is pressure to have congestion pricing reintroduced.
<b>Area or Zone</b>		
London 2003 2007 – Area extended	Reduce congestion and fund public transport	30 per cent fall in traffic
<b>Corridor or Facility</b>		
91 Express Lanes, Orange County, California 1995	Finance 91 Express Lanes and reduce congestion elsewhere	50 per cent reduction in travel time in peak periods.
Salik, Dubai 2007	Congestion charges on selected roads and facilities	25 per cent reduction in traffic and halving of journey times.
Interstate 15	Improve HOV lane utilisation; part fund public transport; and test efficacy of congestion charging	Peak period travel time reduced by approximately six minutes to twenty minutes.

Source: Deloitte, 2010

## 2.2.6 Where has Congestion Charging Failed and why?

Table 2.4 outlines where congestion charging schemes have been proposed and rejected or put on hold, and why.

Table 2.4: Proposed Congestion Charging Schemes Rejected or on Hold

Scheme Type and Location	Stated Objective	Response
<b>Cordon</b>		
San Francisco 2004-2010	Reduce congestion	Under review
Hong Kong Trialled in 1983	Reduce congestion targeting private car usage	Rejected, largely for privacy reasons
New York 2008	Reduce congestion, improve environment and fund public transport	Contentious with neighbouring boroughs; due to delays a federal grant was reallocated. Scheme shelved.
Edinburgh 2005	Reduce congestion, improve environment and fund public transport	Contentious with neighbouring boroughs. Rejected by referendum.
Greater Manchester, Bristol, Leeds and Others	Reduce congestion, improve environment and fund public transport	Promoted through Britain's Transport Innovation Fund (TIF) as a precursor to the 2015 national scheme. Scheme shelved following rejection by Manchester's boroughs.
<b>National Scheme</b>		
The Netherlands Successful trial (one city area) completed February 2010.	Replace fixed costs of vehicle ownership with a variable cost (road user charge) based on km travelled and later congestion levels.	Decision on hold.

Source: Deloitte, 2010



### 2.2.7 What would work in Australia?

Determining the transferability of international examples of congestion charging to the Australian environment is a significant challenge for policy makers and politicians.

This is the key reason why the Moving People 2030 Taskforce recommends a series of trials throughout capital cities to assess what might work and what might not.

Of all of the systems outlined here, cordon and area charging are the least applicable to the Australian urban environment. In the context of Sydney, Hensher observes:

*“...Congestion is at its worst on approaches to the CBD and so will we be able to have much impact on it by charging in such a narrow zone as the CBD? Much of the traffic moving in the areas adjacent to the CBD does not go through the proposed CBD charging zone. With an 80 per cent commuter modal share in favour of public transport in peaks with trips terminating in the Sydney CBD, the balance of 20 per cent of commuter passenger trips by car that terminate in the CBD are in vehicles that are company cars with permanent parking...”<sup>90</sup>*

This viewpoint was supported by BITRE’s work, which concluded that cordon and area charging in city centres would not be viable due to business and retail dispersal away from the centre and a lack of attractive public transport options.<sup>91</sup>

It is BITRE’s view that “facility charging (focusing on congested routes linking the dormitory suburbs with city centres) has more relevance for congestion relief than a city-zone charge.” Rather than limiting the discussion to specific international examples and systems of congestion charging systems, a broader approach in identifying the principles of a good scheme is valuable.

A multi factorial approach from BITRE suggests that the four pillars of success in implementing a congestion

charging scheme are technical, political, financial and economic.

*Technical success* relies on the equipment used and whether it is the best fit for the system’s intended purpose.

*Political success* depends on community acceptance of the scheme. According to BITRE, community acceptance can be engendered by the appropriate use of the revenue from the scheme and by demonstrable benefits such as congestion reduction being achieved.

*Financial success* depends on the revenue generated by the scheme after accounting for the cost of setting it up and the ongoing operational expenses. A scheme such as Singapore’s may achieve revenue neutrality by investing income in reducing other motoring related expenses.

*Economic success* measures the balance between the economic costs and benefits of running the system. It differs from financial success in that it includes costs and benefits to the broader community, not just the operator.

In the Australian environment, an outcomes-focussed approach from Deloitte identifies the following behavioural changes as crucial to the successful implementation of any congestion charging model:

- > reductions in congestion
- > reductions in travel time
- > improved responsiveness in changes to travel demand
- > increased public transport use
- > environmental benefits.

The application of these broad principles is fundamental to the development of a suitable system for the Australian urban environment.

A relevant set of guiding principles for congestion was developed by the UITP, and should be considered in the development of schemes for Australian environments. These are:

- > Establish a sound transport policy demonstrating the necessity and urgency of a pricing scheme
- > Use strong leadership to convince the public of the

90 Hensher, D, 2003, “Side Effects of a Script to Relieve Congestion,” *Sydney Morning Herald* Opinion, September 10, 2003. Accessed online at: <http://www.smh.com.au/articles/2003/09/09/1062902053380.html?from=storyrhs>

91 Bureau of Infrastructure, Transport and Regional Economics, 2008, *Moving urban Australia: can congestion charging unplug our roads?* Working Paper 74. Australian Government, Canberra. Accessible online at: [www.bitre.gov.au/publications/80/Files/WP74.pdf](http://www.bitre.gov.au/publications/80/Files/WP74.pdf)

benefits and to counter potential mistrust

- > Raise awareness on the seriousness of the situation and explain that ‘business as usual’ is simply not an option anymore
- > Involve a wide set of stakeholders for discussion of implementation, while being firm on the principles
- > Be transparent on subsequent outcomes and performance
- > Build a sense of fairness through strong commitments on the use of additional revenues. Links between the scheme and improvements to alternative modes should be explicit
- > Mitigate the impacts on road users through good quality traffic management and/or a reduction in other fixed taxes or charges upon car owners
- > Keep the scheme simple, reflecting not just the need for public acceptability but also to accommodate infrequent users. This means limited exemptions, simple methods of payment, and high levels of technical reliability. A problem that could arise in the future is incompatibility of various city or even national systems, causing confusion and extra cost for users
- > Improve public transport, if possible even before detailed discussion of any potential scheme. Other transport means like car sharing, walking or cycling should equally be promoted
- > Allocate at least a part of the income from congestion charging to help finance these accompanying measures.<sup>92</sup>

*Recommendation: Through the Standing Council on Transport and Infrastructure:*

- > *Agree on a mechanism to conduct congestion charging trials in capital and major cities*
- > *Analyse the potential network wide benefits and costs of introducing variable congestion pricing on existing tolled roads or lanes*
- > *Analyse the benefits and costs of providing alternate travel choices within the areas charges are collected*
- > *Undertake comprehensive community education and information programs about congestion charging.*

## 2.3 Decongesting Our Economy: Travel Demand Management

### 2.3.1 Introduction

As Australia’s population grows improved transport infrastructure alone will be insufficient. Limits to investment as well as space require Australia’s transport networks to be used more efficiently if the worst congestion predictions are to be avoided.

This requires government to motivate individuals to make smarter travel decisions that have least impact.

Travel Demand Management (TDM) is a broad based set of strategies to encourage transport choices that achieve positive social, economic and environmental outcomes.

TDM presents a number of opportunities available for simple and low cost initiatives. TDM initiatives can deliver significant benefits and produce a high return on investment for government.

The Taskforce takes the view that TDM initiatives can be implemented at a local level in a nationally coordinated framework.

The most recent nationally focussed document on TDM was developed by Austroads in 1995.

The Taskforce believes these *Travel Demand*

<sup>92</sup> UITP, 2007, Position Paper: *Urban Mobility and Congestion Charging*, ITP, Brussels.

*Management Guidelines* are still largely relevant and accurate, particularly the performance evaluation criteria and objective and implementation matrices of the guidelines.

The Taskforce believes an update of the guidelines to account for advances in technology related to travel demand management, especially teleworking and e-commuting opportunities, might provide the opportunity for a national discussion on TDM initiatives and how they might be trialled and implemented in the future.

**Recommendation: The Australian Government and State and Territory Governments update the 1995 National Guidelines for Travel Demand Management (TDM) initiatives and investigate opportunities for implementation of TDM programs.**

TDM strategies include, but are not limited to:

- > Teleworking solutions for reducing trips to work
- > Car pooling programs for private and government employees
- > Car parking controls and pricing mechanisms
- > Intelligent transport systems such as:
  - Real time traffic and parking information
  - Traffic signal coordination
  - Public education programs such as TravelSmart.

### 2.3.2 Teleworking – A Technological Solution?

Telework is a relatively recent concept in the Australian work environment although telecommuting has been an element of the work experience in North America and Europe for the last decade.

According to the Australian Government Department of Broadband, Communications and the Digital Economy (DBCDE):

*“Telework is working regularly from a place*

*other than the office, in most cases from a home office. It utilises information and communications technology to stay connected to colleagues and work systems.”*

Other interpretations widen the telework concept to define it by intent rather than the technology employed or the geographical location of teleworkers. This broader definition may become increasingly relevant as teleworking becomes more prevalent in the Australian workplace.

Smart Work Centres, which provide opportunities for shared office space across businesses, are a form of teleworking which brings workplaces closer to where people live.

Teleworking and the travel demand management opportunities it brings has the potential to affect a significant change in traffic flows in our major cities and facilitate the decentralisation of our professional workforce and public services to regional areas.

In November 2012 the Australian Government announced as an element of its Digital Economy Goal and *National Digital Economy Strategy* an intention to double Australia’s level of telework to a minimum of 12 per cent of Australian employees.

Research commissioned by DBCDE, and undertaken by Deloitte, identifies the benefits of telework across the whole transport network, such as:

- > Reduced traffic congestion and infrastructure demand—as telework gets cars off the roads there is less traffic congestion, particularly during peak periods. Lower congestion means the need to expand roads and the public transport network is avoided or deferred.
- > Reduced costs related to commuting and less dependency on the function of transport networks across business.
- > Environmental impacts—the reduced travel and electricity consumption that results from telework leads to a decline in GHG emissions.
- > Increased productivity— telework has been associated with productivity gains owing to the quieter nature of the home work environment, the freedom to work in comfort, and a reduction in exposure to office politics. In addition, many teleworking employees put some of the time saved

from not commuting back into additional time working.<sup>93</sup>

The Telework Coalition estimates that 'for every one per cent reduction in the number of cars on the road there is a three per cent reduction on traffic congestion'.<sup>94</sup> The potential for savings from road congestion avoided are therefore substantial.

Access Economics (2010) estimates a hypothetical 10 per cent increase in the rate of telework for Australia would deliver time and fuel savings worth close to \$810 million.<sup>95</sup>

As levels of congestion abate with increased telework, there is less need to increase the capacity of the road network in order to reduce overall congestion, or even to prevent an increase.

The reduced usage has the added effect of preserving roads' quality and reducing the cost of maintenance. The reduction in congestion may also result in fewer road accidents, as the number of vehicles on the roads declines.

There is also the potential to ease congestion on public transport networks, as fewer workers use public transport to travel to and from work, and capacity concerns are reduced.<sup>96</sup>

**Recommendation: The Australian Government implement telework options for Australian Government employees, and through consultation with industry establish a set of implementation guidelines for teleworking in the private sector that includes voluntary targets for 2030 by sector.**

### 2.3.3 Car Sharing

A growing number of inner-city residents are seeking alternatives to car ownership. Public transport alone is often incapable of servicing their needs.

To bridge this gap there is a significant opportunity to use cars more efficiently, servicing the rising number of people who need relatively infrequent motor vehicle access and do not wish to purchase a car.

Car sharing represents a promising opportunity to achieve this, allowing a single vehicle to be shared among a group, maximising its use. At full capacity, one car share vehicle can replace up to 13 conventional cars.<sup>97</sup>

#### **Case Study: City of Sydney**

*In 2007, the City of Sydney Council began trialling one of Australia's largest and now most successful car share initiatives. The Council outlined a clear policy for operators, and provided the critical mass of parking bays on kerbside and in council-owned car parks required for a car share scheme to succeed.*

*In the last three years, car sharing in the City of Sydney has tripled, with over 10,400 residents and businesses now members, representing 6.4 per cent of households in the area. This has removed the need for more than 6408 cars.*

*In 2012 an economic appraisal was undertaken for the City of Sydney's car share scheme. The study found that the scheme has resulted in a yearly net benefit of \$21 million for local residents, representing a cost:benefit ratio of 19 to 1.*

*In response to this success, the City of Sydney has committed to increasing the uptake of car sharing to 10 per cent of all households by 2016.*

By encouraging more efficient travel patterns, car sharing can reduce individual private vehicle travel by as much as 60 per cent.<sup>98</sup>

While existing for decades, escalating road and parking congestion as well as a number of technological

93 Deloitte, 2011, *Next Generation Telework: A Literature Review*, Department of Broadband, Communications and the Digital Economy, Australian Government, Canberra.

94 Fuhr, J and Pociask, S, 2007, *Broadband Services, Economic and Environmental Benefits*, American Consumer Institute for Citizen Research, Washington DC.

95 Deloitte, 2011, *Next Generation Telework: A Literature Review*, Department of Broadband, Communications and the Digital Economy, Australian Government, Canberra.

96 Deloitte, 2011, *Next Generation Telework: A Literature Review*, Department of Broadband, Communications and the Digital Economy, Australian Government, Canberra.

97 SGS Economic and Planning, 2012, *Benefit-Cost Analysis of Car Share within the City of Sydney*, Council of the City of Sydney, NSW.

98 Litman, T, 1999, *Evaluating Carsharing Benefits*, Victoria Transport Policy Institute, Canada.

innovations have made car sharing far more attractive in recent years. Since 2007, Australia's car share fleet has increased in size by 50 per cent annually.<sup>99</sup> (See Figure 2.7)

The City of Melbourne estimates that for individuals driving less than 15,000km a year, car sharing is generally more cost-effective than conventional vehicle ownership.

Car sharing offers infrequent users of cars an affordable alternative to vehicle ownership. A survey of members of car-sharing organisation Flexicar indicates that 47 per cent have either sold or deferred the purchase of a vehicle since joining. The City of Sydney estimates that in 2011-12 local residents saved \$21m over the costs of owning and running a car. This represents a saving of \$2100 per person per year.<sup>100</sup>

Car share members also derive a number of other benefits including reductions in parking times as well as improved health associated with more active transport choices. An analysis of a similar car share scheme in Philadelphia found that car share members saved an average of \$2,850 annually.<sup>101</sup> (See Figure 2.8)

While currently experiencing unprecedented growth, the future success of the relatively infant Australian car share industry remains uncertain.

To secure its success, governments must recognise car sharing for its true value as an integral addition to the transport task.

To maximise the benefits that can be derived from a productive car share industry there are a number of key reform opportunities available to policy makers.

*Recommendation: Relevant jurisdictions to implement the following measures to encourage car sharing:*

- > **Providing stamp duty incentives to encourage car share operators to use low emission vehicles**
- > **Expanding car share bay allocations for inner-city and metropolitan areas**
- > **Allowing car share bays to replace conventional parking spaces for residential development approvals**
- > **Amending Compulsory Third Party insurance premiums for car share vehicles to accurately reflect risk of accident**
- > **Establishing car share schemes for government organisations**
- > **Integrating car share schemes with public transport smartcards.**

### 2.3.4 Car Pooling

Transport for NSW is undertaking a range of Transport Demand Management (TDM) initiatives, in accordance with the NSW State Plan, including car pooling, which is defined as:

*"...The sharing of rides in a private vehicle among two or more individuals. It involves the use of a person's private or company vehicle to carry one or more fellow passengers, either by using one car or rotating cars..."<sup>102</sup>*

A broader definition of car pooling can be taken to include commercial car sharing programs which are in operation throughout Australia.

Car pooling in Australia is a private enterprise undertaken by individuals with low level recognition by Government, but no direct involvement in funding or developing programs.

The Australian Government's TravelSmart website encourages car pooling without endorsing specific providers.

While an understanding of car pooling behaviours in the

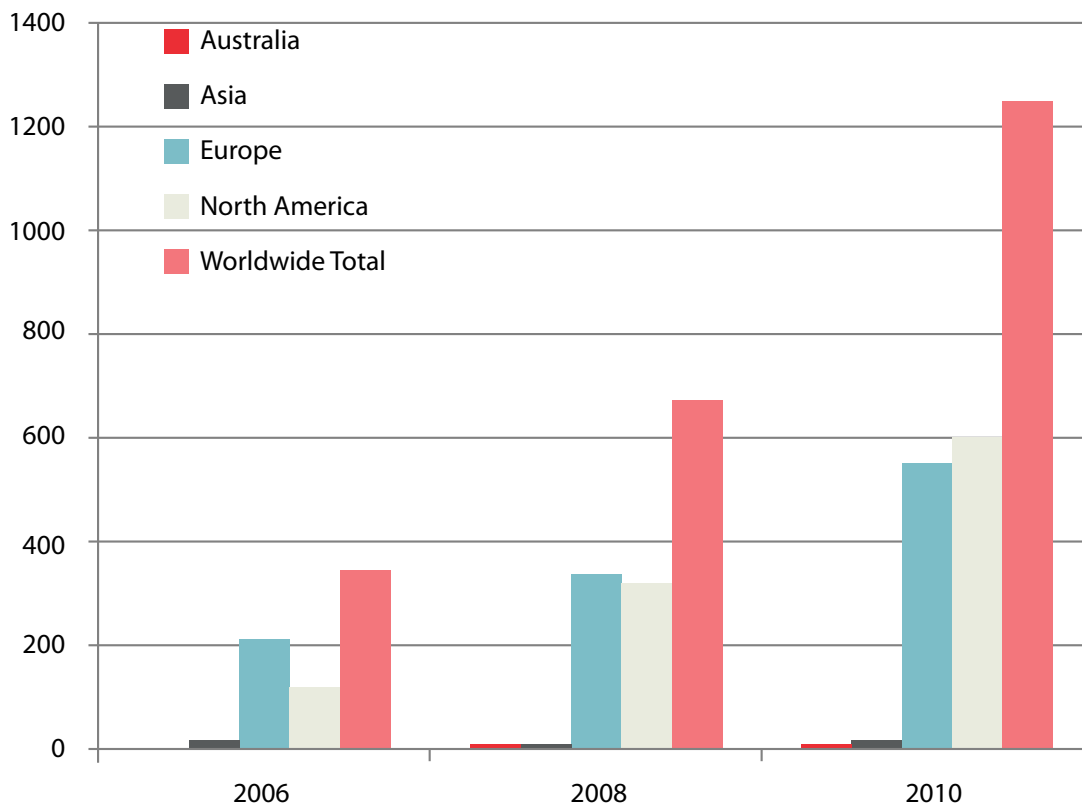
99 Go Get fact sheet

100 SGS Economic and Planning, 2012, *Benefit-Cost Analysis of Car Share within the City of Sydney*, Council of the City of Sydney, NSW.

101 Econsult, 2010, *The Economic and Environmental Impact of PhillyCarShare in the Philadelphia Region*, PhillyCarShare, Philadelphia.

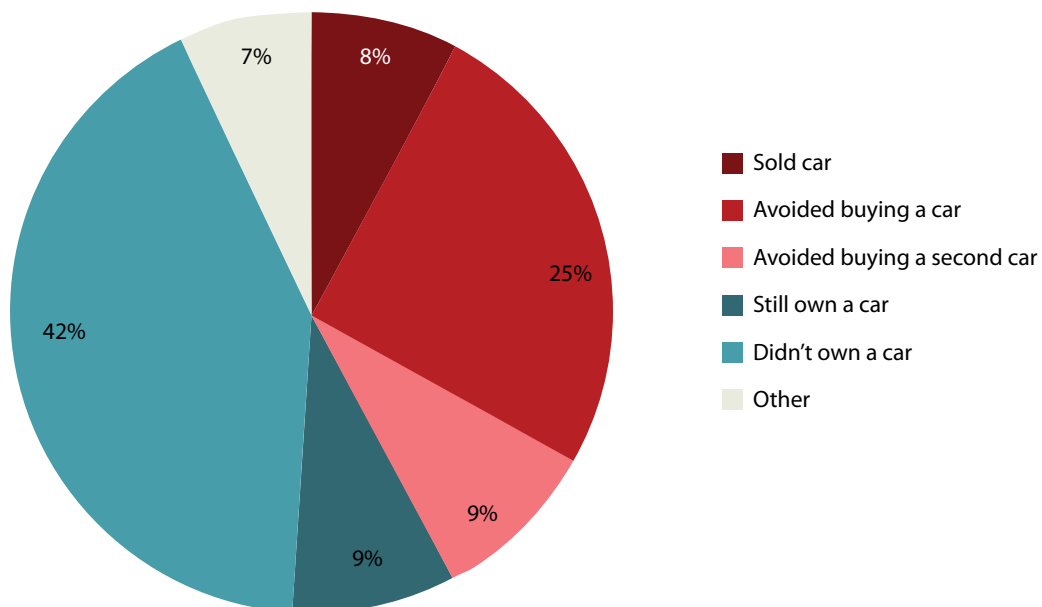
102 <http://www.rta.nsw.gov.au/usingroads/traveldemandmanagement/carpooling.html>

Figure 2.7: World-wide Car Sharing Growth



Source: Go Get [car sharing organisation], 2010-11

Figure 2.8: Car Ownership since Joining a Car Share Scheme



Source: Flexicar



Australian context is still not fully developed, the NSW Government is undertaking video research at a number of car pooling sites into:

- > The timing of vehicle arrival and departure
- > The number of seats in car pool vehicles
- > How many passengers are in the vehicles at both arrival and departure
- > How many passengers were picked up and dropped off
- > How people travel to the car pool site
- > How safety at the site can be improved.

These video surveys will provide the basis for a more detailed analysis of operational and safety issues related to carpooling. A lack of understanding about how carpooling works in the Australian context is not only an impediment to commuters using commercially run programs, but it is also an impediment to Government in developing policy in this area and delivering programs that might encourage the uptake of carpooling in the community.

*Recommendation: The Australian Government and State Governments adopt the Transport for NSW survey model for assessing the performance of and security issues associated with commercial carpooling programs already in operation.*

Benefits delivered by carpooling programs already in operation (see case study, Georgia) include:

- > Reductions in overall vehicle km travelled
- > Savings in transport costs for individuals
- > Long term transport behaviour change amongst users of the program.

International examples demonstrate governments have a role to play in providing incentives for commuters to use carpooling schemes, and that it is possible, with the right understanding of how car pooling works, to develop policy and achieve desirable transport outcomes.

*Recommendation: Governments to investigate opportunities for providing user incentives for carpooling programs.*

**Case study: Georgia Car Pool**

*(Millard-Bal et al (Transportation Research Board), 2005, Carsharing: Where and How it Succeeds, TCRP Report 108, Transportation Research Board, Washington DC.)*

*The State of Georgia in the United States is an example of best practice government support for changing commuter behaviour by encouraging carpooling. Since 1996, employees of an organisation or building have been able to share car trips in order to receive gift vouchers, petrol discounts and cash, paid for by government.*

*Under the scheme, commuters can receive federal funding of \$3 per day, up to a total of \$100, for initiating a car share program for sharing a trip to work with another person. To date, more than 30,000 Georgia commuters have participated in the program, reducing 17.7 million vehicle km, and saving local commuters more than \$5.5 million. The program offers greater rewards for carpooling among three or more people: 30 carpool trips with three people earn a \$40 gas card each month, and with four or more they earn a \$60 card.*

*The decision to provide small rewards for car-poolers is based on the assumption that most commuters are change-averse, and change in travel behaviour is difficult to encourage even if it is convenient and cost-effective. The provision of minor incentives also reduces the psychological barrier to increased carpooling, with numerous studies indicating that individuals are far more likely to proceed with a car pooling agreement when encouraged by a 'token' which can act as an excuse for permitting increased personal contact between co-workers.*

*The scheme has proven highly successful in facilitating meaningful and long-term change. After government funding has ceased, the vast majority of participating Georgia commuters have continued with the initiative. An independent study of the carpooling program found 74 per cent of participants in the \$3 a day program were still using alternatives to driving alone, 18-24 months after they started.*

### 2.3.5 Car Parking Controls and Pricing

Parking controls and pricing can be used as an effective tool in TDM. The revenue collected from parking can also provide a valuable source of funding for investment in alternative and more sustainable forms of transport including buses and trains.

Parking in Australia primarily consists of off-street parking, bundled into the land use of adjacent areas, e.g. residential parking at an apartment building, or on-street parking.

Efficient provision of parking in Australia could serve to constrain demand for car use and more accurate pricing could provide a valuable revenue stream for public and active transport.

An analysis of parking around the world suggests most parking is inefficiently managed. Litman identifies:

*“Currently, most parking is inefficiently priced; it is provided free, significantly subsidised, or bundled (automatically included) with building purchases and rents, forcing consumers to pay for parking facilities regardless of whether or not they want it. When motorists do pay directly for parking, it is often a flat annual or monthly fee, providing little incentive to use an alternative mode occasionally.”<sup>103</sup>*

This sentiment applies to the Australian environment, where minimum parking requirements determine the amount of off-street parking built into new developments.<sup>104</sup>

According to Siebert, the negative outcomes of free parking include:<sup>105</sup>

- > Encouraging car use by making driving appear to be cheaper than it really is, where the hidden cost of the free parking to the consumer comes through increased prices paid for goods
- > Encouraging urban sprawl and encouraging vertical sprawl in higher density developments where apartment buildings are required to provide parking

for residents

- > Increasing the cost of renting and buying homes
- > Equity issues related to the cost of driving as a percentage of household expenditure
- > Aesthetic and urban amenity impacts.

In individual transport plans and strategies, state and territory governments across Australia identify changes to parking management as an element in fostering more sustainable transport choices.

While there are some practical examples of parking management and pricing controls being put in place in some capitals, development requirements for the provision and continued growth in non-residential parking spaces in our capital cities indicates that in the future the cost of “free” parking will continue to grow.

In fact only Sydney, Melbourne and Perth have in place any levy or additional cost system associated with the congestion impacts of non-residential parking spaces in CBD areas.<sup>106</sup>

The number of non-residential parking spaces in the CBDs of Australian capital cities (excluding Darwin and Hobart) increased from 141,690 spaces in 2006 to 153,412 spaces in 2011. (See Table 2.5)

Table 2.5: Non Residential Car Parking Spaces in Australian CBDs 2006 - 2011

	Number		2006-2011	
	2006	2011	No.	%
Sydney CBD	28,543	28,498	-45	-0.2%
Melbourne CBD	38,908	39,898	990	2.5%
Brisbane CBD	21,697	25,141	3,444	15.9%
Adelaide CBD	23,784	25,530	1,746	7.3%
Perth CBD	20,828	22,831	2,003	9.6%
Canberra	7,926	11,514	3,588	45.3%
Total	141,686	153,412	11,726	8.3%

Source: Colliers, 2012

<sup>103</sup> Litman, T, 2012, *Parking Management: Strategies, Evaluation and Planning*, Victoria Transport Policy Institute.

<sup>104</sup> Siebert, C, 2008, *There's no Such Thing as a Free Parking Space*, Policy Winter Issue, Volume 24 Number 2, pp 7-13.

<sup>105</sup> Siebert, C, 2008, *There's no Such Thing as a Free Parking Space*, Policy Winter Issue, Volume 24 Number 2, pp 7-13.

<sup>106</sup> Colliers International, 2012, *Australian CBD Car Parking: The Next Decade*, White Paper, Autumn 2012, accessed online at:

Table 2.6: Future Non-Residential Car Spaces in Australian CBDs 2009-2013

	Number			2009-2011		2011-2013	
	2009	2011	2013	No.	%	No.	%
Sydney CBD	29,447	28,498	28,625	-949	-3.2%	127	0.4%
Melbourne CBD	39,080	39,898	40,612	818	2.1%	714	1.8%
Brisbane CBD	24,474	25,141	25,415	667	2.7%	274	1.1%
Adelaide CBD	25,509	25,530	26,640	21	0.1%	1,110	4.3%
Perth CBD	23,216	22,831	23,715	-385	-1.7%	884	3.9%
Canberra	11,583	11,514	11,784	-69	0.6%	270	2.3%
Total	153,309	153,412	156,791	103	0.1%	3,379	2.2%

Source: Colliers, 2012

While growth has slowed considerably over the past few years,<sup>107</sup> the overall numbers of non-residential car parking places in CBD's are expected to increase to 2013 across all the capital cities as measured in the Colliers study. (See Table 2.6)

The Taskforce believes there is an opportunity for State and Territory Governments to develop a best practice model for parking management in capital cities, which could include elements such as pricing, minimum requirements, and the use of parking revenue to encourage alternative transport choices.

Litman outlines the following principles for consideration in the development of a best practice model:<sup>108</sup>

- > Prices should be well publicised and predictable. Use signs, maps, brochures, websites and other resources to provide information to users
- > Payment systems should be convenient. They should accept coins, bills and credit cards, and allow motorists to pay for just the amount of parking they will use (rather than requiring prepayment based on expected parking duration)
- > Prices should be structured to maintain 85-90% occupancy rates. At more convenient locations, prices should be higher, time increments smaller, and rates may increase over time (e.g., \$1 for the first hour, \$2

for the second hour and \$3 for each subsequent hour) to encourage turnover. Prices should be higher during peak periods and lower during off-peak periods. Less convenient locations can have lower rates and long-term discounts to attract commuters and other longer-term parkers

- > Management programs should anticipate potential spillover problems, and respond with appropriate regulations and enforcement
- > Parking violation enforcement should be predictable and courteous, and adequate to maintain a high level of compliance
- > Parking pricing should be implemented as part of a comprehensive parking management program that includes improved user information, programs, and improvements to alternative modes
- > Parking fees should be coordinated throughout a district or region, so that comparable areas have comparable fees
- > Dedicate some or all of the revenue from on-street parking to benefit local businesses and residents
- > Unbundle parking from building rents, so occupants only pay for the number of parking spaces they want
- > Reduce or eliminate minimum parking requirements so developers can decide how much parking to provide at each destination.

107 Colliers International, 2012, *Australian CBD Car Parking: The Next Decade*, White Paper, Autumn 2012, Colliers, Sydney.

108 Litman, T, 2012, *Parking Management: Strategies, Evaluation and Planning*, Victoria Transport Policy Institute, Canada.

**Recommendation: State and Territory Governments to develop implement practices and policies to manage parking in major cities that:**

- > Facilitate good environmental, social and economic outcomes
- > Serve as a TDM tool for reducing car use and congestion in CBD areas
- > Provide a revenue stream for investment in alternative and sustainable transport modes and services

### 2.3.6 Intelligent Transport Systems

Intelligent Transport Systems (ITS) combine and utilise communications, electronics, navigation and information technology to improve the performance of a transport system.<sup>109</sup>

ITS include:<sup>110</sup>

- > Advanced management systems
- > Advanced traveller information systems
- > Electronic payment systems
- > Advanced vehicle control systems
- > Advanced commercial vehicle operations
- > Advanced public transport systems.

The Australian Government Department of Infrastructure and Transport identifies the benefits of ITS as safety, productivity and environmental performance.<sup>111</sup>

ITS technologies can yield safety benefits by regulating traffic flows, and reduce the severity of traffic accidents

by directing traffic away from accidents and alerting emergency services.<sup>112</sup>

By facilitating innovative use of existing infrastructure, and reducing congestion by regulating traffic flows and spreading peak traffic across an entire road network, ITS can increase productivity across the economy.

An example of ITS improving productivity is found on Interstate 5 in Washington State where:

*“...new high-tech gantries display real-time traffic information about collisions or construction work ahead. Digital speed limits automatically adjust to roadway conditions. Yellow arrows tell drivers to merge. Green arrows show open lanes. And a red x marks a closed lane...”<sup>113</sup>*

By lowering congestion, ITS have the potential to reduce fuel consumption and transport related GHG by 30 per cent compared to motorways and transport networks where they are not in place.<sup>114</sup>

The field of ITS is relatively new, with a lack of historical data available to assess and evaluate projects.<sup>115</sup>

Research being conducted under the ITS Action Plan and Directive from the European Commission (EC) has the potential to clearly define the benefits of various ITS in operation.

The EC Action Plan and Directive was developed in 2010 and data from ITS implementation across EC countries is expected to flow from this process in the future.

In November 2011 all states and territories through the Standing Council of Transport and Infrastructure (SCOTI) agreed to a national ITS framework, the Policy Framework for Intelligent Transport Systems in Australia. The intent of the framework is to ensure uniformity and compatibility between states and territories in the

109 Newman-Askins, Raechelle, Ferreira, Luis and Bunker, Jonathan M, 2003, "Intelligent Transport Systems Evaluation: From theory to practice". In Jaeger, Vicki, Eds. *Proceedings 21st ARRB and 11th REAAA Conference*, Cairns.

110 Newman-Askins, Raechelle, Ferreira, Luis and Bunker, Jonathan M, 2003, "Intelligent Transport Systems Evaluation: From theory to practice". In Jaeger, Vicki, Eds. *Proceedings 21st ARRB and 11th REAAA Conference*, Cairns.

111 Department of Infrastructure and Transport, 2012, *Benefits of Intelligent Transport Systems*, Australian Government, Canberra. Accessed online at <http://www.infrastructure.gov.au/transport/its/benefits.aspx>

112 Department of Infrastructure and Transport, 2012, *Benefits of Intelligent Transport Systems*, Australian Government, Canberra. Accessed online at <http://www.infrastructure.gov.au/transport/its/benefits.aspx>

113 Nicholls, R, 2011, *Smart Highways, Smarter Drivers, Government and Technology*. Accessed online at <http://www.govtech.com/transportation/Smart-Highways-Smarter-Drivers.html>

114 Department of Infrastructure and Transport, 2012, *Benefits of Intelligent Transport Systems*, Australian Government, Canberra. Accessed online at <http://www.infrastructure.gov.au/transport/its/benefits.aspx>

115 Newman-Askins, Raechelle and Ferreira, Luis and Bunker, Jonathan M, 2003, "Intelligent Transport Systems Evaluation: From theory to practice". In Jaeger, Vicki, Eds. *Proceedings 21st ARRB and 11th REAAA Conference*, Cairns.

employment of ITS and to base the implementation and uptake of ITS on a set of commonly agreed policy principles.

According to the Australian Department of Infrastructure and Transport, the framework will:<sup>116</sup>

- > Guide the consistent implementation, integration and uptake of ITS nationally across all land transport modes
- > Promote innovation and competition through interoperable and, where possible, open access and open architecture ITS solutions
- > Provide standardisation for important national and interdependent supplier/provider systems
- > Provide an umbrella for specific sectoral initiatives, which will continue to be developed consistently with the principles and objectives of this framework
- > Facilitate the efficient and rapid uptake of ITS that meet consumer demands, driven by the perceived usefulness and benefits of the technology.

The Taskforce supports the Policy Framework for Intelligent Transport Systems in Australia, and encourages a full adoption of the framework and the development of a national approach to ITS implementation.

**Recommendation: Full adoption of the Policy Framework for Intelligent Transport Systems in Australia and the development of a national approach to ITS.**

### 2.3.7 Travel Smart Programs

TravelSmart programs by the Australian, State and Territory Governments aim to foster travel behaviour change by encouraging people to use other ways of getting about rather than driving alone in a car.

The Australian Government, through the National Travel Behaviour Change Project (NTBCP), partnered with

South Australia, Victoria, Queensland, Western Australia and the ACT, over a five year period from 2003 to 2008 to deliver the project.

Since the conclusion of the original project, there has been no further Australian Government involvement in TravelSmart initiatives at a State level.

Over the five years of the NTBCP, it is estimated the project, at a relatively low cost to the Commonwealth Government, resulted in 186,000 Australian households reducing distances travelled by car, resulting in significant increases in active transport and decreases in GHG emissions.<sup>117</sup>

State Government programs continue (see case studies below) and are being expanded in the foreseeable future in South Australia.

**Case Study: Western Australia - TravelSmart and LivingSmart<sup>118</sup>**

**The Western Australian Travel Smart program achieved:**

- > **10 per cent reduction in car use amongst communities in the program**
- > **13 per cent reduction in car km travelled across the suburbs in which it was delivered**
- > **(an average of 69 fewer car trips per person per year)**
- > **10 million fewer car trips**
- > **100 million reduction in vehicle kilometers**
- > **30,000 tonnes reduction in CO2-e (equivalent of taking 6,000 cars off the road)**
- > **1.6 million extra hours of physical activity**
- > **1.4 million extra public transport trips.**

The reductions in car trips the Western Australian Travel Smart program achieved were largely replaced by walking, bicycle and public transport trips.

Community benefits (based upon the combined results of eight projects reported to date) were projected,

<sup>116</sup> Standing Council on Transport and Infrastructure, 2011, *Policy Framework for Intelligent Transport Systems in Australia*, Australian Government, Canberra.

<sup>117</sup> Department of Planning and Infrastructure Western Australia, 2009, National Healthcare and Hospitals Reform Commission Submission, Western Australian Government, Perth.  
<sup>118</sup> Garnaut Climate Change Review, 2008, WA TravelSmart Case Study, Australian Government, Canberra.

for the full program of 418,500 residents, to be an annual reduction of 30 million car trips, 290 million car kilometres and abating 88,000 tonnes of GHG.

Other community benefits included increased public transport fare revenues, reduced local pollution, increased physical activity (from more walking and cycling), improved social well-being (people on the streets) and increased security (eyes on the street).

The TravelSmart program in Perth delivered a reduction of 750 car km per target person per annum. This approximates to 225 kg of CO<sub>2</sub>-e (full fuel cycle) of abatement per target person.

Each \$1 million in project investment (with 28,000 target persons) delivered 6,300 tonnes of GHG abatement per annum. The first year cost was \$159 per tonne of abatement. Based on an 80 per cent durability of behaviour changes over five years, and no behavioural maintenance costs, the abatement cost fell to \$40 per tonne over five years.

**Case Study: South Australia – Travel Smart Households in the West** <sup>119</sup>

*South Australia's component of the NTBCP became the TravelSmart Households in the West Project. This project was developed by the Department of Transport, Energy and Infrastructure.*

*The project aimed, among other objectives to:*

- > *reduce private car use through behaviour change, measured by vehicle kilometres travelled (VKT)*
- > *achieve ongoing change in travel behaviour*
- > *directly engage people within their own settings and cultural context, capturing interest across all socio-demographic groups*
- > *provide simple, motivating tools and techniques addressing individuals' most significant barriers to behavioural change.*

*The project team worked with participants in the community and discussed with householders specific programs to help reduce dependency on their cars, save money and reduce impact on the environment. These included:*

- > *planning activities ahead, 'trip chaining', giving someone a lift, etc.*
- > *walking to nearby shops and using local services*
- > *participating more in local activities*
- > *travelling to work by train, bus or tram*
- > *walking or cycling*
- > *using the internet or phone for bills and banking.*

*Over the initial four year period of operation the project delivered the following results:*

- > *a drop of 18% in average km travelled daily by participants (through reducing both the number of trips per day and the distance travelled), compared with an increase for non-participants of over 6%*
- > *public transport patronage rose by 6% p.a. in the study regions, compared with the annual rise in other metro regions of less than 2%.*

<sup>119</sup> Department of Water, 2008, Heritage and the Arts and Government of South Australia, *TravelSmart Households in the West*, South Australian Government, Adelaide.



These case studies demonstrate significant benefits to the individual, community and environment can be delivered through “dialogue marketing” for changes in travel behaviour.

The TravelSmart option is a low-cost and effective mechanism for delivering significant improvements to the sustainability of our passenger transport systems.

**Recommendation: The Australian Government to investigate opportunities for similar projects to the NTBCP in conjunction with State and Territory Governments.**

## 2.4 Moving Regional Australians: Connecting People Within and Between Regional Centres and Cities

Transport is critically important to the social, cultural and economic success of every Australian community, from our city centres to remote communities. With freight and passenger transport expected to almost double by 2020, and to continue growing to 2030, the three tiers of government need to take action now.

Roads, bridges, public and active transport infrastructure are the basis of our nation’s mobility. These are the foundations on which transport services depend in order to connect people within communities and connect regional communities to each other.

By 2030, transport infrastructure and the regional connectivity it brings will be integral to the economic development of regional Australia. The Taskforce envisions that by 2030 the active and public transport systems in our regions will play a key role in capturing population growth in our regional centres, ensuring their continued growth and vitality.

### 2.4.1 The Role of Governments in Moving Regional Australia

Local government has a key role in ensuring transport services are delivered directly to citizens and industry across the nation.

Local government has a highly developed understanding of the transport needs of communities. Local Government is best placed to assess the need for a quality access road network for our industries and, with the ageing of our population, increased access to transport alternatives in both urban and regional Australia.

Local government owns and maintains about 650,000 km of local road, a significant amount of public transport infrastructure and more than 200 airports.

In order to manage transport infrastructure, the Australian Local Government Association developed a Roads and Transport Strategy. The Strategy is a partnership between the Australian Government and local governments to deliver efficient, effective, and equitable transport services and infrastructure. It outlines the steps that need to be taken to strengthen communities and the economy and reflects detailed considerations of the issues by local government at the 2006 National Local Roads and Transport Congress.

Currently, many families and businesses in remote and regional Australia frequently have no alternative to the use of private vehicles to meet their everyday transport needs for work, education, freight, industry and social contacts.

This is particularly the case for inter-regional travel. Some community transport is provided by councils and community organisations, but it can only reach so far without ongoing support from the Australian Government and state and territory governments.

Regular air services provide rural and regional communities with access to essential goods and services, including emergency and medical supplies. Access to regular air services outside the major cities is dependent on access to regional airports, the ownership of which was transferred to councils in the early 1990s, along with the financial responsibilities for operating and maintaining them.

It is important for the Australian Government and state and territory governments to recognise the vulnerability of families and businesses in remote and regional Australia. The identification of minimum service and coverage levels for passenger and active transport networks in regional areas is necessary to ensure adequate funding is provided for them.



Tilt Train

City of Cairns



5401





TOWARDS  
NORMANBY

Table 2.7: Estimated Resident Population by Remoteness Category

Remoteness Area	Estimated Resident Population June 30 2001	Estimated Resident Population June 30 2011	Change from 2001 - 2011	% Change
Major Cities	13 231 916	15 449 335	2 217 419	16.8
Inner Regional	3 807 122	4 327 143	520 021	13.7
Outer Regional	1 888 632	2 028 317	139 685	7.4
Remote	314 816	326 764	11 948	3.8
Very Remote	170 754	192 374	21 620	12.7
Total	19 413 240	22 323 933	2 910 693	15.0

Source: Australian Bureau of Statistics, 2012

**Recommendation:** *The Australian Government, in consultation with state and local governments, identify minimum service and coverage levels for passenger and active transport networks in regional centres.*

### 2.4.2 Improving Rural and Regional Mobility through Better Planning

More than 30 per cent of Australians live in regional and rural communities. The issues faced by rural and regional commuters are of a different nature to their urban counterparts', and this is recognised by the Taskforce.

In analyzing 2011 Census Data, the Australian Bureau of Statistics employed the Remoteness Structure of the Australian Standard Geographical classification which breaks Australia down into five Remoteness Area (RA) categories, ranging from Major Cities to Very Remote. (See Table 2.7)

In June 2011, 69% of the population resided in Australia's major cities. In comparison, just 2.3% lived in remote or very remote Australia. Major cities were the fastest-growing RA category in Australia, up 17% in the ten years to June 2011. The remaining categories grew slower than Australia as a whole (15%), with remote

areas growing at the slowest rate (3.8%).<sup>120</sup>

Despite declines in some rural and regional populations over the last decade the overall trend was one of growth.

Rapid growth in some regional areas such as the Hunter Region in NSW, Greater Geelong in Victoria and the Southeast Queensland region can be expected to drive continued growth in demand for transport services and infrastructure to 2030.

In the area of rural and regional transport, a shortage or absence of public transport services, the infrequency of services, the high cost of transport and the lack of connectivity between regional centres are key policy challenges.

Research from the National Institute of Economic and Industry Research shows the typical rural and regional dweller in Australia has a much lower accessibility to services than those living in metropolitan areas with core services falling within a 30km radius in these areas rather than the 1.4km radius in metropolitan areas.<sup>121</sup>

The impacts of these issues are felt most keenly amongst the young people in regional and rural communities, who constitute 6 per cent of our total population. (See Table 2.8)

<sup>120</sup> Australian Bureau of Statistics, 2012, *Australian Standard Geographical Classification*, Australian Government, Canberra.

<sup>121</sup> National Institute of Economic and Industry Research, 2009, *Essential Services in Urban and Regional Australia – a Quantitative Comparison*.

Table 2.8: Impacts of Transport Shortages on Young People in Rural and Regional Australia

Comment	Frequency of Comment
Restrict education and employment opportunities	93
Restricted social opportunities	90
Restricted service (e.g. medical) opportunities	52
Isolation, insularity	52
Car dependency, reliance on others, no independence	32
Stress/dismay	28
Early age drinking/mischief	25
Car purchase results in debt problems	13
Arrive late to work, school or appointment	13
Unsafe behaviours e.g. hitchhiking	11
Unlicensed driving	8
Unsafe walking long distances	7
Strain on accommodation near education and employment centres	6
Poor drive skills/driver fatigue – accidents	6
People leave township	4

Source: Currie, 2005

In their research into rural and regional youth and transport, Currie et al issued the following recommendations for addressing transport challenges faced by young people in these communities:<sup>122</sup>

- > Local youth and community involvement – Consultation with young people and community stakeholders
- > Sustainable funding
- > Regional transport planning coordination
- > Best use of existing infrastructure and resources
- > Generating public awareness of transport options.

This set of recommendations can be broadly applied to all population sets in rural and regional Australia, particularly where driving is not an option.

By viewing regional transport through an accessibility lens, we can see the necessity of moving beyond the ‘silo’ funding approach to a consistent, outcome focused planning framework for moving people.

Through addressing the fragmentation of government responsibilities, we can re-connect passenger transport with its core values of meeting personal accessibility needs and fostering social inclusion.<sup>123</sup>

Research conducted by Dr Janet and Professor John Stanley over the course of the last eight years has identified the challenges faced in delivering rural and regional transport. These include:

- > Specialised community transport, both information and delivery, is decentralized and fragmented
- > In general assets, (both human and fleet) are greatly under-utilised, although peak demand and general demand in some agencies and for some people cannot be met by each operator individually
- > Funding for these services is chaotic and unfocussed and does not deliver a value-for-money result to Government
- > The local service agencies share a genuine desire to provide better mobility options to their clients
- > There are a significant number of people in the area who are socially isolated or have difficulty accessing traditional transport options. An ageing demographic will increase demand for community based transport services and assisted mobility
- > There is a link between lack of mobility and social exclusion, with negative affects both on a personal level and community wide levels
- > There is an opportunity and a need to better integrate and plan services offered to current and future community transport users, thereby making better use of existing and future assets and facilities, delivers better services to the community and reduces social

<sup>122</sup> Currie et al, 2005, *Rural and Regional Young People and Transport, A Report to the National Youth Affairs Research Scheme.*

<sup>123</sup> Stanley, J. and Stanley, J, 2004, *Improving Public Transport to Meet Community Needs: a Warrnambool Case Study, Report prepared for the Bus Association of Victoria and Warrnambool Bus Lines*

exclusion of a large and growing demographic, thereby preventing future costs to the community.

A solution proposed by the Taskforce for addressing the fragmentation of government responsibilities and lack of services, particularly to those who need them the most, is the Passenger Transport Social Enterprise Model.

### 2.4.3 Passenger Transport Social Enterprise: A Rural and Regional Solution

Passenger Transport Social Enterprise (PTSE) is an evolution of the Regional Accessibility Committee (RAC) concept, which has operated in the Warrnambool region since 2004.

A trial of the PTSE model is currently underway in Warrnambool.

PTSE is based on a social enterprise model that seeks to draw together community and other transport providers in an incorporated entity to work collaboratively; share assets, personnel and funding; and ensure coordinated planning of community transport services.

The PTSE addresses identified issues of rural and regional service delivery by better integrating current community transport based services, while aiming to deliver more passenger trips and service km per dollar of current funding.

It is estimated the Warrnambool trial alone will provide an additional 50,000 passenger trips over the two years of operation.

While coordinated community transport through the PTSE model has the potential to ameliorate social exclusion in outer urban, rural and regional communities, linking our disparate regional centres remains a major challenge, and will need additional significant measures from the Australian Government.

**Recommendation: The Australian Government, in consultation with state and local governments, fund a program directed at the trial of Passenger Transport Social Enterprise in Local Government Areas in each state and territory.**

### 2.5.4 High Speed Rail and the Benefits for Regional Australia

High Speed Rail (HSR) linking cities and regional centres along Australia's East Coast continues to interest media and the general public.

Until now, the HSR debate has been dominated by the question of what HSR could do for Australian capital cities. Regional Australia has been largely neglected in the transport debate, and the benefits of HSR for regional Australia have not been fully considered.

The European and Asian experience shows that with HSR, people are willing to travel up to one hour for work and three hours for recreation. Similar attitudes to an Australian HSR would do away with the geographic isolation of our regional centres. Ultimately it would change the way Australians live, work and travel.

HSR holds many benefits for regional Australia, and so it is critical that regional interests are considered in the debate.

To better understand the potential benefits of HSR for regional Australia, the Australasian Railway Association (ARA) commissioned a study to assess the economic and social impacts of HSR in regional New South Wales and Victoria.<sup>124</sup>

According to the study, a HSR network with stations at Sydney, Moss Vale, Canberra, Wagga Wagga, Albury, Shepparton and Melbourne, would transform the way people travel to work and live.

The study found that:

*"In today's dollars, a 250km/hr HSR network from Sydney to Melbourne will provide non-work related economic and social benefits worth an amazing \$5.1 billion per annum."*

The study also found:

*"A 250km/hr HSR link will increase the household income of regional Australians by 1.3 per cent per annum. This is worth almost \$1000 per regional Australian household, the cost of comprehensive health insurance cover for one year."*

<sup>124</sup> Australasian Railway Association, 2012, *Assessing the Wider Economy and Social Impacts of HSR in Australia*, Institute of Transport and Logistics Studies (ITLS), University of Sydney. Accessed online at <http://www.ara.net.au/publications-list>



### 2.5.5 Solving the Rural-Urban Divide with High Speed Rail

The \$5.1 billion of benefits for regional Australia include increased regional property values, transformational change through access to services and amenities, greater social connectedness and the revitalisation of regional centres as places for employment and tourism.

HSR would make it a much more viable proposition to live in regional Australia. Not only would the country lifestyle in regional centres and surrounding areas be more accessible, but regional areas will be less than an hour's travel from vital services.

This would transform regional centres into highly sought after locations to live, increasing property values. The study considered the current transport options available in regional NSW and Victoria, and explored the benefits that HSR could provide. It found that:

*“More than 80 per cent of regional areas travelling to Sydney and almost 90 per cent of regional areas travelling to Melbourne will experience reduced travel times.”*

As well as the \$5.1 billion in non-work related social and economic benefits, HSR would provide short and long term work-related benefits for Australians.

In the short term, businesses would experience greater productivity through shorter travel times and a mode of transport that was more conducive to working whilst travelling.

The productivity benefits for businesses already in regional areas are immense. HSR would provide these businesses with a fast, reliable and cost-effective mode of transport to capital cities for their business related activities.

In the longer term, businesses would be able to use HSR connections to relocate to more affordable locations outside capital cities. An HSR link would also enable regional businesses to attract the necessary employee talent to their businesses, given HSR's positive impact on regional lifestyles. A more diverse workforce would in turn increase the competitiveness and productivity of businesses in redeveloping regions.

Overseas experience shows that HSR quickly leads to regional development. In particular, a study by Morgan Stanley identifies HSR development as a key driver in its

forecast 15 per cent GDP growth in Western China.

An ARA-commissioned review of HSR in the UK, France, Germany, Italy, Spain, China, Taiwan and Japan found that HSR is particularly powerful in increasing land and property values in regional towns and smaller cities.<sup>125</sup>

China, Japan, Spain and the UK all experienced increases in property prices and land values directly linked to HSR networks. Land and property prices linked to France and Italy's HSR networks report mixed results, but this is linked to the need for HSR stations to be easily accessible.

The review found that HSR has the most significant impact on land and property prices when the HSR station is positioned in areas with available space to develop. It also found that it is critical for the HSR network to be part of a redevelopment and/or growth strategy, and to be linked to other forms of transport.

**Recommendation: The Taskforce supports the development of HSR along Australia's east coast, and urges the Australian Government to acquire the land for the HSR corridor.**

<sup>125</sup> Institute of Transport and Logistics Studies, 2012, *Impact of High Speed Rail on Land Values*, University of Sydney, NSW. Accessed online at: <http://www.ara.net.au/publications-list>



*Australian road users do not  
meet the full social costs of  
their travel choices*

# ***CHAPTER 3***



## OUR TRANSPORT SYSTEM IN 2030: A PROSPEROUS NATION (FUNDING)

The Moving People 2030 Taskforce acknowledges that in order to achieve our vision for Australia's transport system in 2030, many of the recommendations contained in this report need to be underpinned by sustainable funding mechanisms.

This chapter of the Report looks at a range of measures to provide governments with a more sustainable framework from which to fund land transport infrastructure projects and programs. It analyses investment and funding arrangements for transport, as well as current taxation arrangements and incentives.

The Report draws on a range of sources including two reports, namely *Moving People: Solutions for a Growing Australia* and *Moving People: Solutions for a Liveable Australia*.

### 3.1 Investment and Funding

#### 3.1.1 Context and some principles

In *Moving People: Solutions for a Liveable Australia*, Stanley argues that there is a strong case to be made that Australian land transport infrastructure spending is below the level that is needed, as evidenced by the decline in real expenditure levels and results of many transport benefit-cost analyses on unfunded proposals.

The consequences include lost productivity gains, lesser levels of environmental improvement, a higher road toll and greater social exclusion.

Infrastructure Australia has highlighted this problem, in the context of increasing demands on government revenues from other sectors as well as infrastructure.<sup>126</sup>

Increasing transport infrastructure and services requires increased funding. The Committee for Melbourne distinguishes infrastructure funding from financing: *funding* refers to the entity that *ultimately* pays for the infrastructure, while *financing* refers to payment up front.

The focus in the current report is on funding.<sup>127</sup> The Committee for Melbourne identifies three main sources of funding:<sup>128</sup>

1. The community via government funds (general taxation)
2. Infrastructure beneficiaries (e.g. value capture levies)
3. Infrastructure users (e.g. congestion taxes; tolls).

As the current fiscal environment in Australia is not conducive to greater reliance on the first of these funding sources; this increases the focus on the second and third avenues, both of which have arguments for efficiency and fairness in their favour.

It has long been recognised that transport expenditure, pricing and funding should be more closely connected. If efficient outcomes are desired, 'user pays' principles should underpin pricing.

More recently, the increasing focus on integrating land use and transport planning has encouraged a broadening of the 'user pays' focus to 'beneficiary

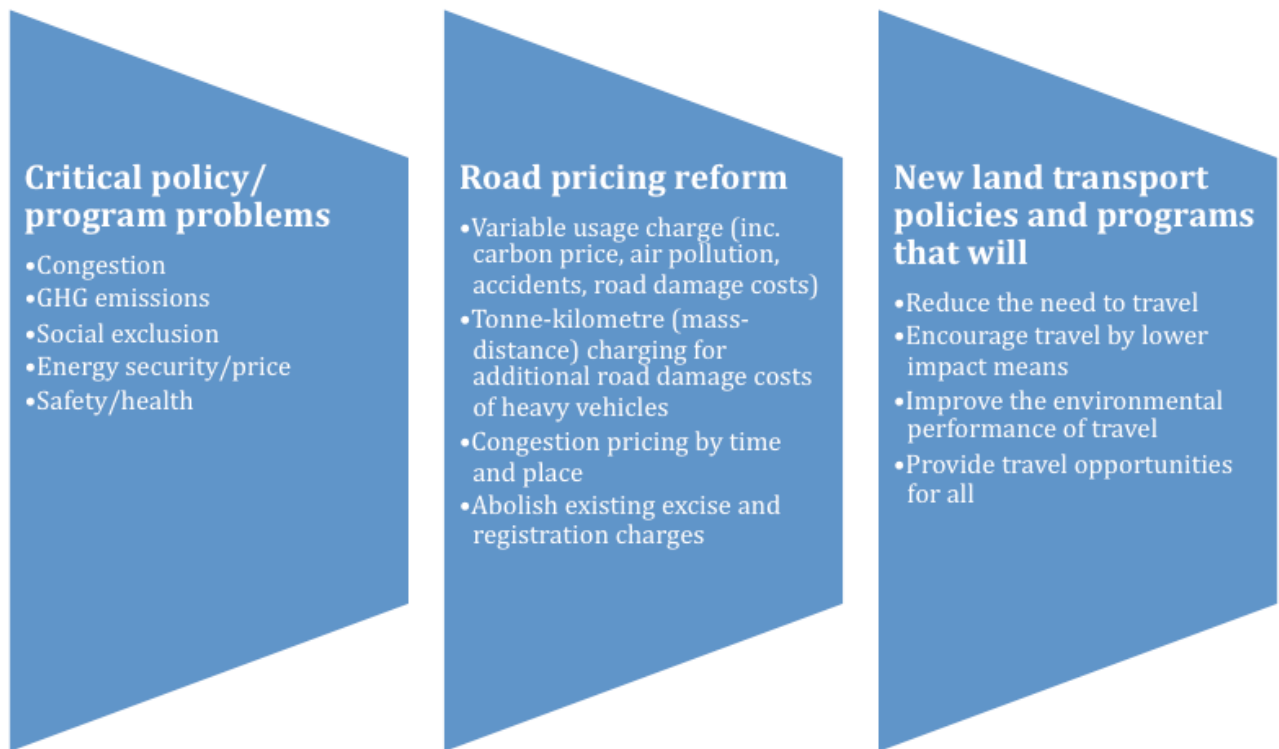
<sup>126</sup> Infrastructure Australia 2012 – *Report to COAG Reform Council* (p46), Commonwealth Government, Department of Infrastructure and Transport, Canberra.

<sup>127</sup> Committee for Melbourne, 2012, *Moving Melbourne: A Transport Financing Discussion Paper*, Committee for Melbourne.

<sup>128</sup> Committee for Melbourne, 2012, *Moving Melbourne: A Transport Financing Discussion Paper*, Committee for Melbourne.



Figure 3.1: Problems and Policy Directions: Moving People – Solutions for a Growing Australia



Source: Stanley and Barrett (2010).

pays’, and a focus on the role that various value capture techniques might play in helping to fund transport infrastructure.

The beneficiary-pays approach recognises users are not necessarily the only ones who might gain from infrastructure improvements.

*Australia’s Future Tax System* (the Henry Tax Review) recommended governments should consider user-pays pricing, through network-wide variable congestion pricing and transparent use of revenues. It also argued for an accelerated roll-out of mass-distance-location charging for heavy vehicles.<sup>129</sup> Infrastructure Australia has supported these recommendations.<sup>130</sup>

*Moving People Solutions for a Growing Australia* argued that pricing reform was central to both behaviour change and funding.<sup>131</sup> It proposed a user pays marginal social

cost pricing regime, as summarised in Figure 3.1, where price signals would be used to influence behaviour and raise revenue. This is a broader approach than congestion pricing as outlined in Chapter 1.

Pricing reform in land transport is a concern in many jurisdictions. The UK Institute for Fiscal Studies has just completed a study on motoring taxation for the UK RAC Foundation.<sup>132</sup>

The report noted the declining fuel tax revenue flow to the national government (from improving fuel efficiency and slowing traffic growth) and its significance for national government revenues in coming years, a £13 billion fall from the current £38b revenue flow by 2029, at current fuel taxation and vehicle excise rates.

The report also pointed out that fuel taxation is an inefficient way to charge for road use, because only a small part of the external costs of road use is correlated with fuel use. To deal with this declining revenue base

129 Henry, K and Treasury, 2010, *Australia’s Future Tax System*, Commonwealth Government, Canberra.

130 Infrastructure Australia 2011, *Report to COAG: Communicating the Need for Action*, Infrastructure Australia, Canberra.

131 Stanley, J. And Barrett, S, 2010, *Moving People Solutions for a Growing Australia*, Produced for the ARA, BIC, UITP, Canberra.

132 Johnson et al, 2012, *Fuel for Thought: The What, Why and How of Motoring Taxation*, Institute for Fiscal Studies/RAC Foundation for Motoring, London.

and improve the efficiency of the pricing regime, Johnson et al recommend a pay-as-you-go pricing system, with road pricing (including congestion charging) allowing reductions in fuel taxes and vehicle excise duties.

In the United State the US Federal gas tax contributes revenue to the Highway Trust Fund. That tax, however, has been unchanged at 18.4c/gallon since 1993. Revenue flows into the Fund are declining as per capita car use drops and fuel economy rates improve, resulting in less money for spending on roads and public transport (both of which receive money from the Fund). Congress has had to provide top up funding since 2008. The US National Surface Transportation Infrastructure Financing Commission report, *Paying Our Way*, proposes shifting from the current US road funding system, based largely on indirect user fees in the form of federal motor taxes, toward a new system built around more direct user charges, in the form of fees for miles driven.<sup>133</sup>

The Commission points out that the current US transport system is underpriced, and that a vehicle mile travelled (VMT) charging system, which would strengthen the connections between expenditure, pricing and funding, is the consensus choice for the future. The Commission proposed the US Federal Government commit to deploying such a system by 2020.

The US Commission set out six guiding principles for its funding and finance framework: the funding and finance framework:<sup>134</sup>

1. Must support the overall goal of enhancing mobility of all users of the transportation system
2. Must generate sufficient funding to meet national investment needs on a sustainable basis
3. Should cause users and direct beneficiaries to bear the full cost of using the transportation system to the greatest extent possible. This will not be possible in all instances, and when it is not, any cross-subsidisation must be intentional, fully transparent, and designed to meet network goals, equity goals, or other compelling purposes

4. Should encourage investment in the transportation system
5. Should incorporate equity considerations – for example, generational equity, equity across income groups, and geographic equity
6. Should support the broad public policy objectives of energy independence and environmental protection.

These are useful guidelines for pricing and funding reform in Australia.

### 3.1.2 User pays in the Australian context

An important user pays charging principle argued in *Moving People: Solutions for a Liveable Australia* is that transport users should generally be confronted with meeting the social costs of their travel choices, unless there are good policy reasons for doing otherwise. It raises the question of how much Australian road users currently pay in various road taxes and charges.

In *Moving People: Solutions for a Liveable Australia*, Stanley conducted an extensive analysis of the trends in Australia regarding road user taxes and charges (including fuel excise, state and territory charges, and tolls) and the extent to which these taxes and charges cover the costs of road use (including external costs).

One of the main conclusions from this research is that Australian road users do not meet the full social costs of their travel choices. It is increasingly arguable that they may not even meet the direct road infrastructure/ servicing costs associated with their road use.

Stanley argues there is a growing gap between the total cost (including social or external) costs of road use in Australia, and current road user charges, suggesting there is an urgent need for road pricing reform.

*Moving People: Solutions for a Liveable Australia* suggests a road pricing system incorporating:

- > A use-based charge to cover carbon costs (which could remain as a fuel-based charge, like excise)
- > A use-based charge to cover the costs of road construction and maintenance attributable to lighter vehicles (distance and location based)
- > A tonne kilometre charges for the additional road

<sup>133</sup> US National Surface Transportation Infrastructure Financing Commission, 2009, *Paying Our Way: A New Framework for Transportation Finance*, Washington DC.

<sup>134</sup> US National Surface Transportation Infrastructure Financing Commission, 2009, *Paying Our Way: A New Framework for Transportation Finance*, Washington DC. (pp 26-27)



damage attributable to heavy vehicles (distance and location based)

- > A use-based charge to cover the external cost component of accident costs (distance and location based)
- > Use-based charges to levy the more polluting vehicles for their health (air pollution) costs (distance and location based)
- > A congestion pricing scheme to make users accountable for the congestion costs attributable to their road use (distance, location and time based).

The Taskforce would support further exploration of the need for road pricing reform as a way of providing a sustainable funding mechanism for transport infrastructure and services and engendering positive travel behaviour outcomes.

### 3.1.3 Value Capture mechanisms

User-pays funding mechanisms can be complemented by a range of value capture mechanisms. These sit somewhere between general taxation and user charges as a revenue source, being essentially viewed as payments by non-user beneficiaries, for example landowners or developers.

The Centre for Transportation Studies at the University of Minnesota has identified a number of value capture mechanisms that are potentially useful as a means of funding transportation infrastructure, as set out in Table 3.1.<sup>135</sup>

The 2012 Infrastructure Finance Working Group report, *Infrastructure Finance and Funding Reform*, recommends use of techniques such as value capture.

#### 3.1.3.1 Tax Increment Financing

Tax Increment Financing (TIF) is widely used in the US and is now being used by local government in the UK to help drive local investment and economic growth.<sup>136</sup> In essence, TIF allows (usually) local government to borrow against predicted growth in locally sourced revenues in

a defined area, to help fund activities that will drive that growth.

TIF has been used for fifty years in the US to fund a range of infrastructure and development projects, with almost every US state having passed relevant enabling legislation. Bonds are usually issued to provide the necessary upfront funds for infrastructure/urban renewal initiatives, additional annual local tax revenues being used to meet interest and principal repayments. TIF is particularly suited to an urban renewal context.

TIF might also be relevant at state level, where the incremental revenues could be state property related taxes (primarily land tax and stamp duty). This revenue would be used mainly to fund infrastructure otherwise funded by state governments.

A key issue in relation to TIF as a possible funding source is the extent to which the infrastructure programs being financed lead to a net increase in development related revenues to the sponsoring government, as distinct from simply diverting revenue from one area to another (even within the same municipality). US evidence on this account is mixed, with Dye and Merriman, for example, finding little evidence that TIF actually led to net new development in a Chicago area case study.<sup>137</sup>

In a governmental context where infrastructure is in short supply and available capital funds are scarce, net increases in governmental revenue streams seem more likely to be realisable to meet payments on borrowings for infrastructure.

This would seem to be the case in Australia at present, particularly in cities where population growth pressures are severe. Major urban renewal projects, which usually include substantial transport infrastructure components, should be suitable candidates. Joint ventures between government land agencies and local government, or between local government and the private sector, could see local government drawing on TIF finance to help accelerate infrastructure provision and its subsequent rate income flows.

<sup>135</sup> Centre for Transportation Studies, 2009, *Value Capture for Transportation Finance*, Centre for Transportation Studies, Minnesota.

<sup>136</sup> The Property Council of Australia (2012) calls this funding method Growth Area Bonds.

<sup>137</sup> Dye, R, and Merriman, D, 2006, "Tax Increment Financing: A Tool for Local Economic Development", *Land Lines*: January 2006, Volume 18, No 1, accessed online at [http://www.lincolinst.edu/pubs/1076\\_Land-Lines--January-2006--Volume-18--Number-1](http://www.lincolinst.edu/pubs/1076_Land-Lines--January-2006--Volume-18--Number-1)

Table 3.1: Value Capture in a Framework of Transportation Finance

Funding Mechanism	Beneficiaries		Measurement of Benefit	Finance Instrument
General revenue	General public		General tax base	General fund allocation; property tax; transportation sales tax (US)
Value capture	Restricted non-user beneficiaries	Landowners	Land value growth	Land value taxes
			Property tax growth	Tax increment financing
			Assessed special benefits	Special assessments
			Transportation utility	Transportation utility fees
		Developers	Off-site development opportunities	Development impact fees
			Off-site access benefits	Negotiated exactions
			Development privileges	Joint development
		On-site development opportunities	Air rights	
User fees	Users of transportation facilities	Vehicle operators	Gas consumption	Gas taxes
			Mileage	Mileage-based charges
			Vehicle units/types	Vehicle sales tax; license tab fee; wheelage fees
			General access rights	Tolling
			Demand-controlled access rights	Congestion pricing
			Rights to incur environmental impacts	Transportation environmental taxes/fees
		Passengers	Ridership	Fares or permits

Source: Centre for Transportation Studies, 2009.

### 3.1.3.2 Special Assessments

These impose special charges on property close to a new facility, with the charges only being raised for those properties that receive a special (identifiable) benefit from the public improvement, such as a new transport facility. Committee for Melbourne uses the generic description of Benefitted Area Levy for this type of funding source.<sup>138</sup> For example, Melbourne's Regional Rail Link and Sydney's North West Rail project will benefit properties located adjacent to proposed stations.

Some value capture in relation to such properties also may be pursued through means such as air rights development or joint development projects, as discussed below, but all properties that will clearly gain could be subject to a special assessment. This approach has much in common with TIF.

The Property Council of Australia (PCA) notes that a number of Australian jurisdictions apply a value capture levy, citing the example of a recently introduced value capture charge introduced in Queensland by the Urban Land Development Authority.<sup>139</sup>

### 3.1.3.3 Metropolitan Improvement Levy

This is a broad-based charge related to all properties in a large area, set at a low rate and used to fund specific government services. It might be levied at a flat rate per property, or as a proportion of property value. The advantage of the latter is that it implies an element of value capture, and is not as regressive as a flat levy. Discussing this approach in a transport context, the Committee for Melbourne calls this a Broad-Based Transport Improvement Levy. Melbourne has a Parks Levy, for example, which fits this model.

One way to increase the availability of funding for transport infrastructure and service initiatives that deliver community value would be to implement such a levy, hypothecated for transport purposes, particularly where the relevant services are widespread throughout the charging area, such as public transport.

For example, a metropolitan improvement levy could be used to help fund public transport service costs in

growing suburbs, on the argument that there are direct user benefits, 'option benefits' (essentially insurance benefits, to those who might possibly need to, or wish to, use the service at some future time - a form of beneficiary-pays) and reduced external costs of road use from the availability of such services. The likely redistribution of revenue raised from inner and middle areas to outer areas may have equity benefits, since most public transport service benefits currently accrue to inner-to-middle urban residents.

### 3.1.3.4 Developer Contributions

Developer contributions are one-time charges levied on new development to help recover costs of public infrastructure and services. They are commonly used in Australia for greenfields development and major projects such as Docklands.

Levying such charges on a consistent basis across all new urban development is appropriate, particularly with urban infill being expected to play a bigger role in most cities.

### 3.1.3.5 Negotiated Exactions

Negotiated exactions might cover similar types of costs to a development impact fee, but would be subject to negotiation, rather than being the outcome of a formal, formulaic process. They may be in-kind contributions (e.g. of open space), instead of money. The Centre for Transportation Studies explains that negotiated exactions are not typically applied to off-site infrastructure provision.<sup>140</sup>

### 3.1.3.6 Joint Development

In a transport context, joint development refers to the development of a transport facility and adjacent private real estate, often based around a railway station where higher density development might accompany station redevelopment (e.g. transit oriented development).

In an Australian setting, this might involve a partnership between a public land development agency or transport authority, and a private sector developer.

<sup>138</sup> Committee for Melbourne, 2012, *Moving Melbourne: A Transport Financing Discussion Paper*, Committee for Melbourne.

<sup>139</sup> Property Council of Australia, 2012, *Securing Victoria's Future: A program to Plan Fund and Deliver Infrastructure*, Property Council of Australia, Melbourne.

<sup>140</sup> Centre for Transportation Studies, 2009, *Value Capture for Transportation Finance*, Centre for Transportation Studies, Minnesota.

Joint development may include air rights development such as above a railway station.

### 3.1.3.7 Air Rights

Air rights agreements establish the right to develop above or below a facility, in exchange for a financial contribution or future additional property and/or income taxes. Revenue from such an initiative may be used for a range of public purposes, such as place making, but is most likely to be retained within the development site.

Major new transport projects, or urban development projects, may add value to the space above or below a transport facility. For example, air rights above Wurundjeri Way in Docklands, Melbourne, have been part of a development proposal before the market for bidding in early 2012.

In Australian cities, developments above railway stations usually have a high cost for podium development, relative to surrounding land prices. This typically means high density development will be needed to establish a financially feasible opportunity.

Such proposals are unlikely to generate sufficient funding to facilitate developments beyond those covered by the particular joint development arrangements, but they can be significant for a small number of major development opportunities.

## 3.1.4 Other Land Transport Funding Opportunities

### 3.1.4.1 Increased Borrowings

A traditional way of financing investment in land transport infrastructure has been government borrowings. A major advantage of this approach is that it enables the funding of these financing costs to be spread over the life, or part thereof, of the asset, so that the generation(s) that benefit can meet the financing costs.

A disadvantage, however, is that these costs are not specifically financed by users (unless explicitly levied as a user charge for the facility developed with the borrowings, like a toll) but by taxpayers more broadly. In the current fiscal environment, where the Australian Government and state and territory governments are seeking to keep a tight rein on spending, increased borrowings for infrastructure are not popular politically,

even if the relevant investment might generate significant public value.

The Governor of the Reserve Bank was quoted as saying:

*"In fact, the Commonwealth of Australia and its constituent states are at present able to borrow at about the lowest rates since Federation."<sup>141</sup>*

Such historically low borrowing costs, in real terms, should encourage governments to look closely at doing more with this funding source.

The Victorian Division of the Property Council of Australia (PCA) has examined the scope for the Victorian Government to increase its level of debt funding of infrastructure, as part of a concerted effort to lift the state's level of infrastructure improvement.<sup>142</sup> This is seen as fundamental to lifting the state's declining rate of productivity growth. PCA note that the state's budget position is in good shape, and that Victoria has perhaps the least likelihood of any state of its credit rating being downgraded. Drawing on US and Queensland experience, the report suggests that if the state's credit rating were to be downgraded from AAA to AA+, this would increase interest rates by between 0.4 and 0.7 percentage points.

PCA's analysis suggests Victoria's net infrastructure investment "... is set to decline back to pre-2006 levels (when expressed as a share of GSP) by 2014-15". They further suggest the state might be able to borrow an additional \$3b per annum for three years (\$9b in total) without exceeding a net-debt-plus-superannuation to revenue ratio of 130 per cent, and thus avoid downgrading of credit risk.

Borrowing an additional \$5b (rather than \$3b) annually for three years would see this ratio reach 139 per cent in year 3. The report suggests that this would be likely to result in a downgrade from AAA to AA, but the increased borrowing costs occasioned by such a downgrade might be justified if the relevant investment were well chosen.

Given that the PCA analysis picked Victoria for its investigation, the state it thought was best placed

<sup>141</sup> *The Age*, 26 July 2012, Business Day page 1.

<sup>142</sup> Property Council of Australia (Victorian Division) 2011, *Pre-budget Submission 2011-12*, accessed online at <http://www.propertyoz.com.au/library/Victorian%20Pre%20Budget%20Submission%202011%202012.pdf> Interestingly, this report gave no attention to user pays financing methods.

in terms of credit risk, it would not be appropriate to extrapolate Victoria's results to a national figure. The analysis does, however, suggest current infrastructure borrowing constraints may be too tight, and productivity benefits could flow from a more relaxed borrowing stance, as part of a wider package of infrastructure funding streams.

The \$9b identified by PCA as potentially able to be funded by increased borrowings would be sufficient to meet almost one quarter of the estimated capital costs (of \$38.9b) of the state's top transport infrastructure priorities identified by PCA.<sup>143</sup>

The current focus on maintaining AAA credit ratings has been noted by the Infrastructure Finance Working Group, who argue that:

*"Arguably, rigidly applying the strategy of maintaining AAA credit ratings can be counter-productive, particularly where States have a range of important infrastructure projects with high economic value ... that need to be undertaken promptly and can generate long-lasting benefits."*<sup>144</sup>

### 3.1.4.2 Public-Private Partnerships (PPPs)

PPPs have played a major role in development of some of Australia's most significant transport infrastructure investments over the past couple of decades, particularly urban toll roads, where private equity and borrowings for infrastructure financing are rewarded through associated user-pays toll funding. Public transport service delivery contracts for private sector provision also represent a form of PPP.

As an investment vehicle, PPPs have lost some of their lustre in recent years, with concern over high and escalating bidding costs, and some significant shareholder losses with some poor bid projects which have been vulnerable to 'optimism bias'.

PCA indicates private borrowing costs are perhaps 200 basis points above public costs, suggesting PPPs need to play a role of complementing publicly funded infrastructure, so that the total level of investment is higher than would otherwise be possible. Higher private

sector borrowing costs and profit expectations, in a risky environment, mean careful selection of major projects for PPPs is vital. From a public sector viewpoint, it is critical that the granting of a major transport PPP, with its associated long term operating rights, does not entail significant loss of transport network control.

In view of the losses on some major recent projects, it might be worthwhile for the public sector to take more of the construction stage risk for some PPP projects, with the operational stage being contracted out once traffic flows have settled down (essentially as a management contract).

Level crossing abolition programs in capital cities, especially Melbourne, provide an interesting opportunity for PPPs. Bundling a number of projects for bidding might attract a better price than a series of one-off bids. More importantly, given high project costs, tolling of vehicles might be an effective way to help meet project costs. This has the additional advantage of reinforcing the concept of user pays. Electronic tolling could be used to this end, with the state or perhaps local government being party to the proposal.

### 3.1.4.3 Asset sales

Infrastructure Australia has drawn attention to the possible sale or lease of government assets as a means of freeing up funds for new infrastructure. For example, the NSW Government has announced its intention to re-invest into state infrastructure some of the proceeds from selling a long term lease of Port Botany.<sup>145</sup>

Sale of existing freeways is another possibility for raising substantial sums. This could take form of outright sale; a long term management lease; or perhaps the narrower form of the sale of a lane on a freeway, for use as a high occupancy toll lane.

Asset sales and privatisation of service delivery have been used by states and territories for many years to free up funds for investment and shift infrastructure commitments to the private sector.

The Taskforce supports the Infrastructure Australia approach, which includes stimulating an informed community discussion about the arguments for and

143 Property Council of Australia, 2012, *Securing Victoria's Future: A program to Plan Fund and Deliver Infrastructure*, Property Council of Australia, Melbourne.

144 Infrastructure Finance Working Group, 2012, *Infrastructure Finance and Funding Reform*, Report to Infrastructure Australia.

145 *Infrastructure Australia 2012 – Report to COAG Reform Council* (p46), Commonwealth Government, Department of Infrastructure and Transport, Canberra.

against retaining assets in government ownership.

### 3.1.5 Conclusions on Sustainable Funding

Declining revenues and a growing infrastructure backlog in Australia highlight the urgency of finding new ways to fund transport infrastructure.

Arguments of efficiency and fairness both support a greater reliance on user pays and beneficiary pays pricing systems. User pays systems have the benefit of reducing the size of the apparent investment backlog by encouraging behavior change, providing equity concerns are addressed.

The increased focus on land use and transport integration as a policy direction focuses attention on how the benefits of transport infrastructure are transmitted through the urban system. Much benefit will ultimately accrue to land owners, who should contribute to the costs of the initiatives that increase the value of their assets.

This beneficiary-pays approach could be used more widely, and there are a range of value capture mechanisms available to this end.

Optimising funding opportunities across various payment mechanisms (user-pays, various beneficiary-pays options, and direct government funding) requires careful balancing of the funds raised from each mechanism, to ensure the total funding structure is effective and equitable.

Across all funding sources, an increased total commitment will be required in coming years to lift productivity and enhance liveability and social inclusion, while protecting the environment. Public transport fares are a further potential source of revenue. Fare revenues typically meet less than half the operating costs of public transport in Australian cities. Higher cost recovery targets should be set when reformed road user charging is in place, with retention of suitable concession fares on equity grounds.

Metropolitan land use and transport strategies should specify how various funding sources will be combined to fund the transport initiatives required in the plan. This implies that an Infrastructure Plan should accompany a Land Use Plan and Transport Plan, along the lines proposed in NSW.

**Recommendation: Standing Council on Transport and Infrastructure to investigate the options for sustainable funding of transport infrastructure.**

### 3.1.6 Summary of Sustainable Funding Options

- > A use-based charge to cover carbon costs (which could remain as a fuel-based charge, like excise)
- > A use-based charge to cover the costs of road construction and maintenance attributable to lighter vehicles (distance and location based)
- > A tonne kilometre charges for the additional road damage attributable to heavy vehicles (distance and location based)
- > A use-based charge to cover the external cost component of accident costs (distance and location based)
- > Use-based charges to levy the more polluting vehicles for their health (air pollution) costs (distance and location based)
- > A congestion pricing scheme to make users accountable for the congestion costs attributable to their road use (distance, location and time based)
- > Road user charges (excluding tolls): pay for road costs, including externalities, and contribute to costs of public transport (capital/operating deficit), walking and cycling initiatives that reduce the external costs of road use
- > Tolls: fund (wholly or in part) the financing costs of specific works on which the tolls have been levied or perhaps specific works on other related links. Higher tolls on congested portions of existing tollways could be used for purposes that can be negotiated with the operator. New tolls on congested existing freeways could be used for road improvements or to contribute to public transport improvements that help ease congestion (if the tolls are privately levied following asset sale, the asset sale revenues can be used for similar purposes)



- > Metropolitan improvement levy: fund part of the public transport operating deficit, particularly for services in growth areas. Such a levy might also be used to fund other metropolitan services, such as place-making initiatives
- > Borrowings (can be public or private): fund major public or private projects, on which user charges or tolls might be imposed that can help to repay borrowings
- > Private equity: a component of the cost of financing PPP's, with tolls and perhaps a government contribution used to provide a return
- > Tax Increment Financing and special exactions/ rates (value capture mechanisms): involve direct government revenue streams that are used to fund borrowings that have been used for specific investments that will increase property values, which may be transport investments
- > General Council rates: fund the access component of local road costs
- > Federal/State grants: national roads, state roads and part of local roads, until such time as road user charging provides the revenue stream to fund the road costs; major public transport capital. The grants could be from hypothecated excise revenue or some revenues from asset sales
- > Public transport fares: Fares are a further source of revenue.

## 3.2 Tax and Public Transport

### 3.2.1 Introduction

As Australia faces the dual challenges of rising urban congestion and the need to move towards a low carbon economy, encouraging sustainable and efficient transport has never been more important. While the development of 'hard infrastructure' such as new roads, train lines, and rolling stock is vital for meeting Australia's transport task to 2030, the creation of a strong structural taxation framework is required not only to fund this infrastructure, but also to encourage individuals to make more efficient transport choices.

Australia's existing taxation environment for transport is an ineffective demand management tool, potentially

encouraging people away from sustainable transport. This generates perverse outcomes, increasing congestion and carbon emissions as well as reducing revenue for reinvestment. The Taskforce believes there is a strong case to better use taxation to encourage public and active transport.

### 3.2.2 The GST and Public Transport

The Goods and Service Tax is collected on a range of activities related to the operation and use of public transport systems in Australia.

GST is collected on public transport fares, vehicle and rolling stock purchases, and the materials used in the manufacture of public transport vehicles.

Some of the resultant GST revenue is utilised by states for the development of road infrastructure. This infrastructure supports activities such as car use that run counter to the goal of the Australian Government attempting to foster a sustainable transport culture.

The Taskforce believes the Australian Government should invest GST collected from expenditure related to public transport into an Australian Government Public and Active Transport Fund.

Estimates of the revenue collected would be developed through business reporting from public transport operators, including the GST paid on fuel excise, which could be measured through rebate claims under the Fuel Tax Credits Scheme.

The GST collected on fuel excise from all vehicles alone is estimated to be in the vicinity of \$2b per annum, so we can assume the sum collected from all public transport operations will be a sizeable amount.

The benefits of this funding system include:

- > Responsibility for public transport service delivery remains with State and Local Governments
- > The revenue burden on the community is not increased, and it can further be argued that the savings in urban congestion and environmental costs will result in a positive economic outcome
- > The administrative burden would be limited
- > The benefits of consuming transport offset the costs.

This measure would not be a world first; in 2007 the Singapore Government committed millions of dollars of GST revenue to a dedicated public transport fund as part of their GST offset package.

### 3.2.3 Fringe Benefits Tax

Australia’s ability to transition to a more efficient transport system by 2030 is inhibited by a taxation environment that favours private vehicles. One of the most notable examples of this is the application of Fringe Benefits Tax (FBT) on salary packaged vehicles.

Until May 2011, Australia’s FBT scheme unintentionally encouraged car travel as the payable tax rate reduced for salary packaged vehicles as the number of vehicle kilometres travelled increased. This encouraged people to drive unnecessarily in order to access a more favourable tax rate. (See Table 3.2)

Table 3.2: Fringe Benefits Tax Rate for Car Travel

Yearly km Travelled	Statutory Rate
Less than 14,999	26%
15,000 to 24,999	20%
25,000 to 40,000	11%
Over 40,000	7%

Source: ATO (2011)

In light of this inefficiency, incremental tax incentives based on km travelled were replaced in 2011 with a flat rate of 20 per cent. This has been an important first step in addressing the inequality in the tax treatment of private and public transport. However, FBT still gives preferential treatment to private motor vehicles over public transport. If an employer meets the cost of an employee’s public transport costs, the full FBT rate of 46.5 per cent is applied, compared to only 20 per cent for cars. As a result, despite being less damaging than in the past, Fringe Benefits Tax still inadvertently increases congestion and transport sector carbon emissions by increasing the relative cost of public transport.

FBT should be reformed to level the playing field between salary-packaged vehicles and public transport, and remove perverse incentives for employees. This would not only increase public transport mode share for commuter trips, but also free up revenue for more productive purposes. Subsidies for salary packaged private vehicles and related expenses total more than

\$600 million per year,<sup>146</sup> representing a significant opportunity to put government spending on transport to better use.

Extending FBT tax incentives for public transport use has already achieved significant success abroad. In the United States, commuters have had access to tax-free benefits for employer-provided public transport costs for more than two decades. Under the scheme, employers can provide a tax-free allowance for commuter-related expenses including public transport fares, parking, carpooling and cycling costs. Eligible employees can also ‘cash out’ the effective value of an employee parking space as a tax-free salary bonus.

Analysis from the US indicates that commuter benefits programs can be a highly successful demand management tool. The initiative has reduced peak motor vehicle use by up to 30 per cent with a corresponding increase in public transport use by employees of 10 to 50 per cent.<sup>147</sup>

The Taskforce believes that Australia should replicate this success. At a minimum, the playing field between public transport and private vehicle should be equalised, either through a cessation of FBT incentives for private vehicles or the implementation of corresponding scheme for public transport.

**Recommendation: Implement tax based incentive schemes to encourage work related public transport trips.**

### 3.2.4 Diversifying Taxation on Transport

While there are a number of specific opportunities to amend transport taxation that are of considerable merit, there is no ‘silver bullet’ solution.

There are a wide array of important factors that Australia’s future transport system must address,

<sup>146</sup> Tourism and Transport Forum, Tax Incentives for Public Transport, 2011

<sup>147</sup> Replugle, M. (2002): Address to the Committee on Transportation and Infrastructure, U.S. House of Representatives, May 21, 2002.

Table 3.3: Possible Road Taxation Structures Related to Carbon Economies

Previous arrangement		Current arrangement		Australia 2030	
Target	Instrument	Target	Instrument	Target	Instrument
General revenue raising	Fuel taxes, state taxes on motor vehicles	Carbon Emissions	Carbon Tax	Carbon Emissions	Carbon Tax
		General revenue raising	Fuel taxes, state taxes on motor vehicles	Congestion	Location and time based charges
				Road usage	Mass, location and distance based charges
				Other social costs	Specific taxes, charges or regulations
				Efficient revenue raising	Fuel tax, annual registration

Source: Tourism & Transport Forum, *Funding Challenges of Public Transport*, 2012<sup>148</sup>

including speed, reliability, safety, affordability and carbon efficiency.

A number of different tax mechanisms are required to meet the requirements of each. While any good tax policy should address multiple objectives of the transport task, any one in isolation can have unintended consequences. For example, price discounts for low emission vehicles are effective at cutting carbon emissions, but can also encourage congestion. Similarly, subsidisation of public transport over roads reduces emissions and congestion, but can leave lower socio-economic areas facing accessibility issues, as well as having adverse impacts on freight efficiency.

Given the wide divergence of goals and methods to achieve them, Australia must enact a comprehensive and integrated approach to tax that accurately reflects the true cost of transport.

It is the view of the Taskforce that price signals in relation to factors such as emissions, congestion, road maintenance and other social costs are vital to achieving this.

Above (Table 3.3) is an example of how Australia’s future taxation environment could be modified to better fund and encourage efficient use of transport.

### 3.2.5 Ride to Work Incentives

Providing a ‘Ride to Work’ tax incentive has also proved successful. In the UK, evaluations have revealed that by early 2011, 15,000 employers had signed up to provide bikes (to a maximum value of £1,000) to their employers for commuting, and over 400,000 people had taken advantage of the scheme.

Under the scheme 649,000 car trips were replaced each week, and it was the UK’s second most popular salary sacrifice based employee benefit.<sup>149</sup>

The evaluation showed that 76% of users would not have purchased a bike without the cycle to work scheme, and 70% of users classified themselves as novice or occasional cyclists. There was a higher take

148 Accessed online at <http://www.ttf.org.au/Content/ptfundingchallenges0910.aspx>

149 Cycle to Work Alliance, 2011, *Behavioural Impact Analysis*, Cycle to Work Alliance, UK.

up by 'lower rate' taxpayers (73%), and 87% noticed improvements in their health since joining the scheme.<sup>150</sup>

Internationally, some countries also pay cash subsidies to citizens in return for kilometres travelled by active transport. In Belgium the employer is allowed to provide a tax free payment for commuting by bicycle of €0.20/km up to a distance of 15km per day. In the Netherlands, AUD\$25 per person is spent on active travel/bicycle initiatives.<sup>151</sup>

**Recommendation: Standing Council on Transport and Infrastructure conduct a comprehensive review of transport taxation arrangements**

**Recommendation: Implement targeted incentives or ride to work incentive schemes to increase bicycling mode share as a percentage of all trips to work and education.**

### 3.2.6 Carbon Pricing and Public Transport

The inclusion of heavy vehicles in the Clean Energy Plan from the Australian Government (carbon pricing scheme) addresses the growth in emissions from the freight sector.<sup>152</sup>

In announcing details of the policy, Prime Minister Julia Gillard acknowledged the importance of public transport in the abatement of transport sector emissions.<sup>153</sup>

In fact the Prime Minister, in launching the Clean Energy Plan, referred to it as the "equivalent of taking 45 million cars off the road."

In its current form, the carbon price effectively reinforces the modal inequity between private and public transport

by exempting fuel for light passenger vehicles but being positioned to impose a carbon price on diesel used in bus passenger transport vehicles by 2014, and imposing the price immediately on diesel used by trains.

The decision to exempt petrol sends incorrect price signals to commuters. It is estimated by Professor Stanley that a carbon price of \$23 per tonne will add about 6 cents a litre to diesel prices, and that this will result in a cost imposition of almost \$40 million annually in direct costs to the bus industry.<sup>154</sup>

Stanley contends that due to the nature of bus contracts around Australia, the carbon price will be passed through to the state governments. This will increase public transport fares, and result in a loss of public transport patronage.<sup>155</sup>

According to Stanley, an alternative to the politically unpopular increase in public transport fares may see state governments "*forgo future investment in public transport, to compensate for the extra costs of current services because of carbon pricing.*" This would see added impacts to congestion, and social issues related to a lack of public transport services.<sup>156</sup>

The Taskforce takes the view that the carbon produced by public transport operations should be viewed as "good carbon" in the sense the emissions related to public transport have the effect of reducing GHG and carbon emissions related to car use.

While it may not be possible to separate buses and rail from heavy vehicles under the Clean Energy Plan, the Taskforce believes complimentary measures under the scheme can be used to offset any cost imposition on public transport operations.

In a 2010 speech as Secretary of the Department of Climate Change and Energy Efficiency, Dr Martin Parkinson identified that "*support for the development of new low-emission energy technologies, integration of climate considerations into transport planning, provision of general energy efficiency information, and addressing*

150 Cycle to Work Alliance, 2011, *Behavioural Impact Analysis*, Cycle to Work Alliance, UK.

151 Cycle to Work Alliance, 2011, *Behavioural Impact Analysis*, Cycle to Work Alliance, UK.

152 Stanley, J, 2011, "Public Transport – Collateral Damage of our New Carbon Price", *The Conversation* 11 July, 2011, accessed online at <https://theconversation.edu.au/public-transport-collateral-damage-of-our-new-carbon-price-2181>.

153 Tourism and Transport Forum, 2011, Position Paper: Tax Incentives for Sustainable Transport, Tourism and Transport Forum, Sydney.

154 Stanley, J, 2011, "Public Transport – Collateral Damage of our New Carbon Price", *The Conversation* 11 July, 2011, accessed online at <https://theconversation.edu.au/public-transport-collateral-damage-of-our-new-carbon-price-2181>.

155 Stanley, J, 2011, "Public Transport – Collateral Damage of our New Carbon Price", *The Conversation* 11 July, 2011, accessed online at <https://theconversation.edu.au/public-transport-collateral-damage-of-our-new-carbon-price-2181>.

156 Stanley, J, 2011, "Public Transport – Collateral Damage of our New Carbon Price", *The Conversation* 11 July, 2011, accessed online at <https://theconversation.edu.au/public-transport-collateral-damage-of-our-new-carbon-price-2181>.

*split incentives in rental markets*” were important elements in reducing carbon emissions.<sup>157</sup>

There are a range of opportunities for complimentary measures under the Clean Energy Future Plan to support public transport operators and encourage the expansion and improvement of public transport services.

These include, but are not limited to:

- > The development of a clean fleet scheme to upgrade the bus and train fleet
- > The investment of carbon pricing revenue in public and active transport infrastructure
- > Investment in TravelSmart initiatives through the scheme.

*Recommendation Any carbon pricing system to be undertaken by the Australian Government to reflect the environmental impacts and benefits of different modes of transport and include complimentary measures such as investment in encouraging low-carbon transport choice; public transport, walking and cycling.*

This would constitute an investment in the bus industry of 1.5 per cent of existing value.<sup>158</sup>

Other assets related to the operation of rail and bus public transport networks could be considered in this measure.

**Recommendation: Implement public transport asset depreciation incentives for public transport operators.**

### 3.2.6 Depreciation of Public Transport assets

Depreciation of public transport assets can be used as an innovative mechanism to fund public transport services through forgone tax receipts rather than direct investment in rolling stock or infrastructure.

An example of this is the statutory effective life cap for buses. If this were returned from its current level of 7.5 years to 5 years, it would serve as an incentive measure for the upgrade of the Australian bus fleet and the expansion of bus public transport services, and reduce the operating cost of a bus over its life by 1.5 per cent.

157 Gittins, Ross, 2011, “A carbon price can’t save the planet by itself”, *Sydney Morning Herald*, accessed online at <http://www.smh.com.au/environment/climate-change/a-carbon-price-cant-save-the-planet-by-itself-20110212-1ar5b.html>

158 Bus Industry Confederation, 2012, Bus Industry Confederation Submission to the Clean Energy Draft Law, Bus Industry Confederation, Canberra





*Transport and logistics accounts for as much as 9 per cent of Gross Domestic Product in Australia*



# ***CHAPTER 4***



# OUR TRANSPORT SYSTEM IN 2030: A PROSPEROUS NATION (FREIGHT)

## 4.1 Meeting the Freight Challenge

### 4.1.1 Introduction

This section of the report outlines the freight challenges facing government, industry and the Australian people in the immediate future and as we move towards 2030.

This section of the report provides a set of recommendations from the Taskforce to address these challenges, in particular where freight and passenger movement interrelate.

### 4.1.2 A Growing Task

Australia's freight industry has been growing for the last 40 years. This trend, which is associated with increasing GDP and population growth, is expected to continue strongly over the next 40 years. Freight movements are expected to double by 2030 (See Figure 4.1).

According to Infrastructure Australia, in this period:

- > truck traffic is predicted to increase by 50%
- > rail freight is expected to jump 90%
- > the number of containers crossing the nation's wharves will increase by 150%.

The effect of growing freight movements is expected to be felt most acutely in the capital cities, particularly in Sydney and Melbourne, where Australia's two busiest ports for containerised freight movements, Port Botany and the Port of Melbourne, are located.

*The Taskforce recognises freight and the movement of goods between our cities and regions is the lifeblood of Australia's economy and quality of life. The bulk of recommendations in this report, while not directly related to freight, will add considerably to improving freight flows between and through Australia's cities and regions by increasing the modal share of active and public transport and easing congestion on our road networks.*

*The Taskforce believes the efficient movement of freight cannot be achieved without a strategy that integrates it with the efficient movement of people, especially in and around our cities.*

*How we manage the movement of freight, especially in relation to light commercial vehicles delivering to the inner and outer suburbs of cities, has a significant impact on the ways people will travel to work or play in the future.*

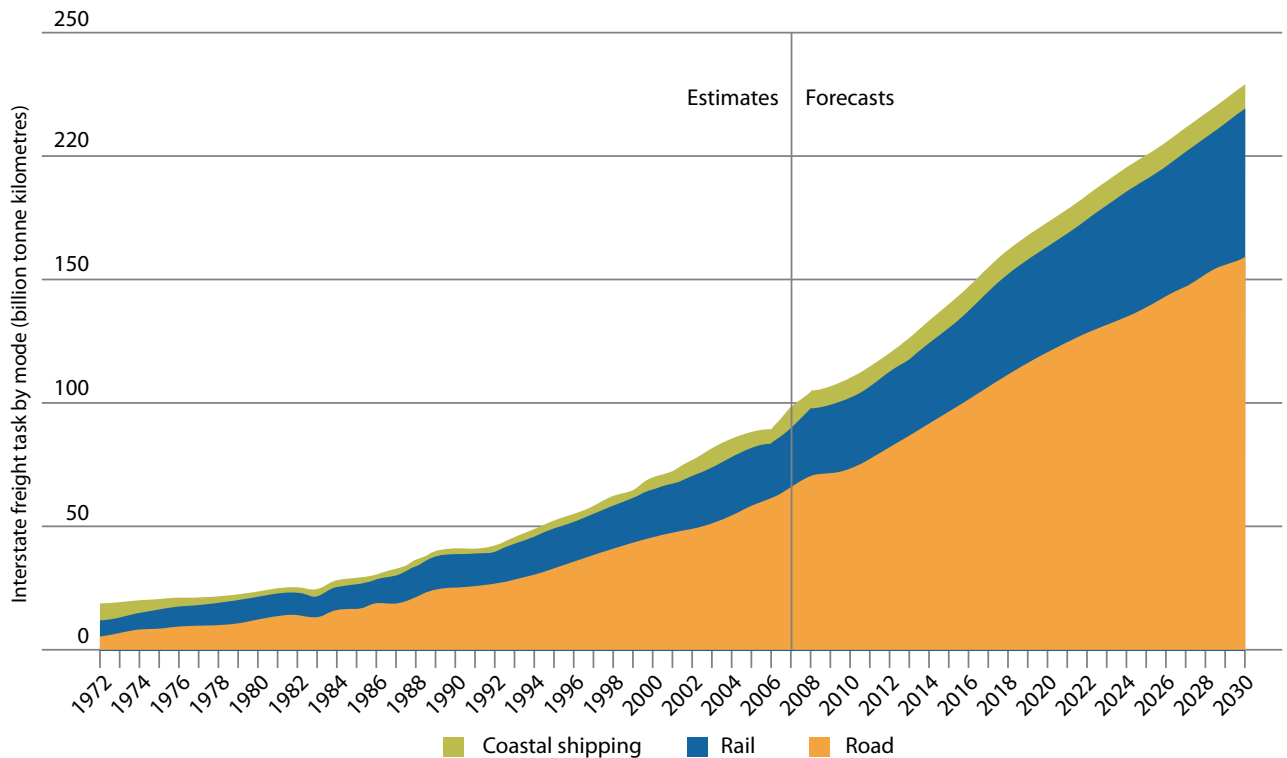
*There is room for better coordination of freight movement to see a shift of bulk freight onto rail, but this is not a panacea for the challenges related to the freight task. The efficient movement of people, especially in major cities, will provide the greatest assistance to the freight sector in meeting the challenges of the doubling of the freight task by 2030.*

Container trade through the Port of Melbourne reached a record level in 2011, exceeding 2.5 million containers, an increase of 6.6 percent on the 2010 record. Port Botany has enjoyed similar growth, exceeding 2 million containers for the first time in 2010-11.

There are signs that this growth will need to be managed in the future.

All major metropolitan areas are experiencing rising traffic congestion, reduced travel speeds, and growing levels of development limiting scope for increasing capacity around key freight routes. Truck congestion at Port Botany in Sydney has led the New South Wales Government to announce an off-peak incentive scheme to lower the high levels of peak period congestion and

Figure 4.1: Future Freight Task for Australia



Source: BITRE estimates, 2010

spread freight volume more evenly.<sup>159</sup>

These unfavourable conditions contribute to public amenity and environmental issues, and are also a key factor contributing to relatively poor productivity levels for the sector in recent years. Productivity in the transport sector has increased by only 0.6 percent per annum in the five years to June 2011.<sup>160</sup>

The Bureau of Infrastructure, Transport and Regional Economics (BITRE) states:

*“...in the absence of further heavy vehicle productivity enhancing regulatory reform, fleetwide heavy vehicle average loads are likely to increase by less than 5 per cent between 2010 and 2030...”<sup>161</sup>*

This assessment of truck productivity to 2030 indicates that the uptake of higher productivity vehicles such as B-triples and AB-triples is likely to have a relatively small impact on productivity, with container freight representing less than 20 per cent of total road freight.<sup>162</sup>

There is a growing need for policy makers to ensure Australia has in place appropriate national infrastructure, underpinned by a national regulatory framework, to meet these freight challenges.

This section of the report aims to provide a number of options to achieve this important economic, social and environmental outcome.

159 Price Waterhouse Coopers, 2009, *Meeting the 2050 Freight Challenge*, Infrastructure Partnerships Australia, Sydney.

160 Australian Bureau of Statistics, 2011, *Estimates of Industry Multifactor Productivity 2010-2011*, Australian Government, Canberra.

161 Bureau of Infrastructure, Transport and Regional Economics, 2010, *Truck Productivity: Sources, Trends and Future Prospects*, Report 123, Australian Government, Canberra.

162 Bureau of Infrastructure, Transport and Regional Economics, 2010, *Truck Productivity: Sources, Trends and Future Prospects*, Report 123, Australian Government, Canberra.

## 4.2 Freight Challenges for 2030

In 2012, the Australian Logistics Council released its Infrastructure Report titled *Towards an Efficient Freight Future*. The report contains a number of recommendations for Government and industry to meet Australia's future freight challenges.

The report found that:<sup>163</sup>

- > More needs to be done to improve access to key intermodal facilities and ports which are critical links in the supply chain, particularly in our cities
- > There is an ongoing need for all levels of government to develop and implement clearly articulated freight transport plans to drive greater efficiencies
- > The Australian Government should make infrastructure funding conditional on states achieving specific reforms, such as each capital city having a 20-year freight strategy consistent with the National Freight and Port Strategies
- > More needs to be done to translate infrastructure proposals into actions, and
- > Infrastructure Australia (IA) should undertake transparent and public reporting on the numerous national strategies and infrastructure projects that IA has recommended.

The Taskforce supports the proposal that each state and territory develop freight strategies for 2030, within a national framework.

## 4.3 State Freight Strategies

In order to achieve a truly efficient freight transport system, key policy objectives and principles in the States' freight strategies must align with:

- > the national outcomes
- > the policy objectives of other modes of transport such as passenger transport
- > land use policies (to identify and protect future

transport corridors and multi-modal freight facility sites).

If each State implements a fully integrated freight strategy, this will create a freight system that is effective, productive and able to respond to the growing demand.

In addition to being fully integrated with other modes of transport and land use policy, the state's freight strategy should aim to maintain competitive neutrality across all modes of transport. A properly functioning transport market free from distortions is the key to efficient freight transport. Competitive neutrality means that government economic and operational regulations apply equally to all modes of transport to avoid an artificial bias towards any mode of transport.

It is also recommended that each freight strategy address the current market failure in the transport sector, perpetuated by the lack of consideration given to the social costs and benefits or externalities associated with the movement of freight in policy, regulatory and funding decisions. These costs and benefits include environmental impacts such as emissions, noise and land use, safety impacts such as fatalities, injuries and property damage as well as the impact on congestion.

If the decision making process cannot internalise these costs, State governments must ensure that the mode that exhibits the best safety and environmental performance receives incentives or subsidies to ensure that the community enjoys the benefits of this superior performance. For example, rail transport may be selected over heavy vehicles for freight transport because rail helps relieve congestion.

A recent study conducted by Deloitte Access Economics and published by the Australasian Railway Association found that:

- > the average freight train takes 110 trucks off the road. This reduces truck movement by around 49.7 million truck kilometres a year
- > in one year, one freight train travelling between Melbourne and Brisbane reduces carbon emissions by the same amount as planting 600 hectares of trees - an area the size of Sydney's CBD, Hyde Park, the Domain, the Botanical Gardens, Pyrmont and Central Station; or almost 8.5 times the size of Brisbane's CBD.

Each freight strategy needs to clearly state the social, environmental and economic policy objectives for freight

<sup>163</sup> Australian Logistics Council, 2012, *Towards an Efficient Freight Future*, Australian Logistics Council, Canberra.

transport within its jurisdiction. These objectives may include environmental performance (emissions, noise, land use), safety, reducing congestion, competitive markets (ensuring freight users have viable modal transport options), energy security and efficiency. Investment decisions in land freight infrastructure should be based on the capacity to implement these socio-economic objectives and avoid negative social costs.

**Recommendation: State Governments develop 2030 freight strategies as a condition of funding under the Nation Building Program within the requirements of the National Urban Policy.**

These strategies can merge with existing 2030 transport and land use planning strategies to complete the picture for State Governments in developing long term approaches to the movement of people and goods.

To this end, the National Urban Policy from the Australian Government specifies, as a condition for funding through the Nation Building Program, that State Governments develop 20 year freight strategies for each capital city by 2014.

In *Meeting the 2050 Freight Challenge*, Infrastructure Partnerships Australia identified, "...a need for truly integrated long-term (50 year) planning across transport modes to focus on achieving efficient end-to-end movements in a freight supply chain, often featuring multiple modes...", as one of the key barriers to the freight sector meeting future growth in the freight task.

It is the Taskforce's view that the development of the National Land Freight Strategy by Infrastructure Australia represents the framework for a long term plan that integrates various modes of freight movement.

The National Land Freight Strategy from Infrastructure Australia incorporates considerations for the relationship between passenger and freight movement.

## 4.4 Addressing the Regulatory Burden

For years the arbitrary delineation of road and rail has created inconsistent economic regulations that have provided an artificial price advantage to one mode of road transport over another. The Moving People

Taskforce believes that a single national economic regulatory framework for land transport would ensure consistent principles underpinning any road pricing regime and rail access charges. This in turn will ensure competitive neutrality between road and rail freight, and an efficient and competitive market for land transport.

### 4.4.1 Land Transport Economic Regulatory Framework

For years the arbitrary delineation of road and rail has created inconsistent economic regulations that have provided an artificial price advantage to one mode of road transport over another. The Moving People Taskforce believes that a single national approach in transport economic regulations should be explored to ensure that consistent principles underpin any road pricing regime and rail access charges. This in turn will ensure competitive neutrality between road and rail freight, and an efficient and competitive market for land transport.

As part of this approach, the Moving People 2030 Taskforce also supports the consolidation and rationalisation of other regulatory requirements pertaining to freight transport. At present, separate state operational and economic regulations can create a significant compliance cost for national freight carriers, as do modal based regulations for multi-modal freight service providers. For example, prior to the establishment of the National Rail Safety Regulator, a national rail operator was required to comply with seven rail safety regulators, three transport accident investigators and fifteen Occupational Health and Safety Acts. In addition to this, the operator is also required to comply with the regulatory requirements of six access regulators and seventy-five environmental management Acts. The latter compliance regime is still in place at the present time. Consolidating and rationalising these regulatory requirements will minimise barriers to effective competition and balance the interests of transport investors and users as well as maximise the efficiency of freight assets.



*Recommendation: The Taskforce recommends that the Australian Government, in consultation with the State Governments, review regulatory frameworks to ensure competitive neutrality between road and rail freight and appropriate consolidation and rationalisation of regulatory requirements.*

The Taskforce believes there should be a process put in place to identify opportunities for beneficial sharing

of infrastructure between public transport and freight movement, and where the need exists for dedicated public and active transport infrastructure separate from freight and passenger car networks.

## 4.5 Mass-Distance-Location Heavy Vehicle Charging

Mass-distance-location (MDL) heavy vehicle charging is the most effective road pricing reform mechanism that can be implemented in Australia. This form of road access pricing would address





the significant shortcomings of the current PAYGO system, target vehicles that cause the most damage to road infrastructure, be cost effective in terms of implementation and operation, and have the ability to capture the social and environmental impacts of freight transportation. In addition to these advantages, MDL can also be quickly implemented. A MDL charging system would need to take into account the social and environmental benefits of buses over 4.5t which are classified as heavy vehicle.

*Recommendation: The Taskforce recommends that the Australian Government implement mass-distance-location charging for heavy vehicles that includes recognition of the environmental and social benefit of buses.*





*Subiaco – Transit Orientated  
Developments bring transport,  
services and housing together to  
reduce the number of required trips*

# ***CHAPTER 5***





# OUR TRANSPORT SYSTEM IN 2030: A LIVEABLE NATION

*The task of moving people in 2030 will be directly affected by how we plan and build our cities over the next two decades.*

*This chapter explores how urban form, through density and land use aspects, can affect travel or influence transport outcomes.*

*It also looks at measures to achieve greater integration between transport and land use planning and to build a liveable nation.*

## 5.1 Urban Form and Transport

'Urban form' is defined by the physical attributes of the city, and can loosely be defined as any area where people live. The urban form, and its specific attributes explored in this chapter, also defines the way in which people interact with the built environment, each other and perform functions.

The urban form of a city or neighbourhood also affects the way in which people move, and has great influence on the transport decisions of individuals and communities.

Transport decision-making at a strategic level often focuses on the efficiencies of moving people and goods through a network, with economic and commercial interests being the primary focus of benefits analysis. This neglects the role transport has in how people interact with the urban form, and how the urban form can influence the way in which people move.

There are several key links between urban form and transport. A clear understanding of these links can ensure transport projects are clearly designed, prioritised and implemented to enhance the long term planning goals of our cities and regions. The two key links explored in this chapter are Urban Density and Mixed Land Use.

## 5.2 Urban Density

The density of an urban area is generally defined by the number of people who reside in the area, and is usually expressed in terms of persons or dwellings per square kilometre (eg persons/km<sup>2</sup>). The more people that live in an area, the higher the density.

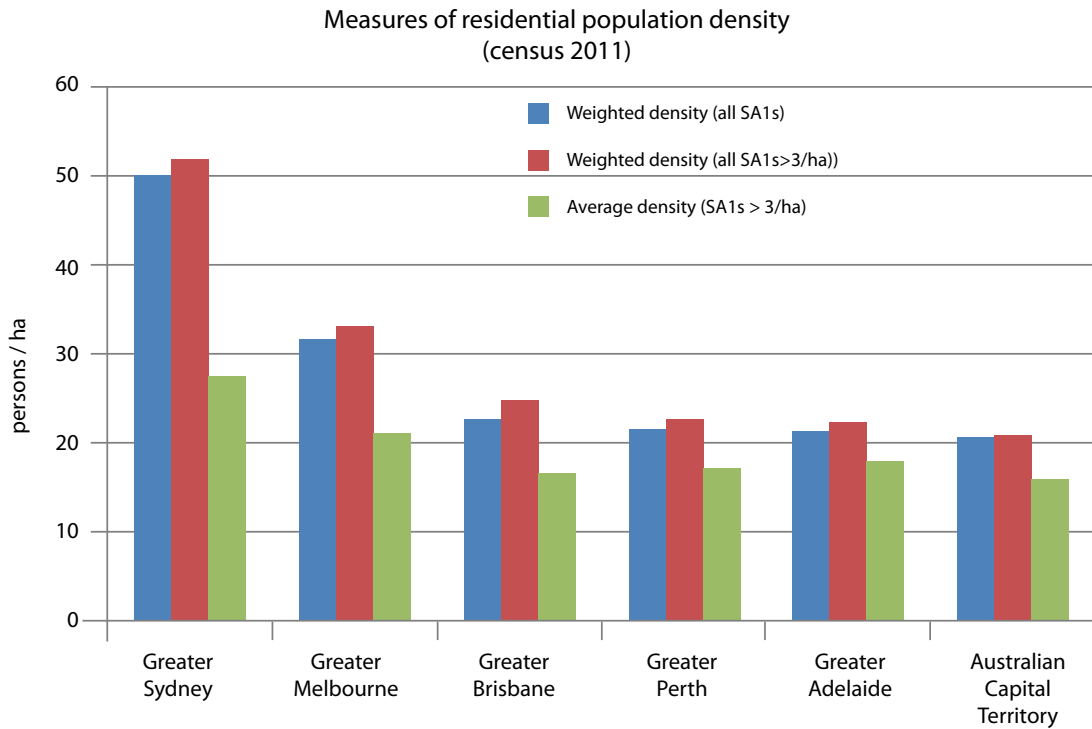
A comparison between five mainland capitals shows that there is variation in the densities of people in Australia's cities; however, in general, they tend to be lower than those of international cities.

Sydney is the most densely populated city, with significant sections in the 3,000 to 5,000+ persons/km<sup>2</sup> range. Sydney, however, still has a significant portion of its population living in lower density urban areas (i.e. in the 0-1,000 persons/km<sup>2</sup> range). In comparison, Adelaide does not have populations in the higher urban density ranges, but has a higher portion of its population in the 0-1,000 persons/km<sup>2</sup> range. (See Figure 5.1)

'Urban sprawl', characterised by lower urban density and fringe development, has led to Australian cities having an unsustainable reliance on private vehicle travel, and increased costs of transportation.<sup>164</sup> (See Figure 5.2)

<sup>164</sup> Newman et al, 2010, *The Costs of Urban Sprawl – Infrastructure and Transportation*, Environment Design Guide April 2010.

Figure 5.1: Densities of Australian Cities



Source: Modified from Australian Bureau of Statistics, Regional Population Growth, Australia, July 2012.

Figure 5.2: Costs of Transport Related to Inner-City vs Fringe Development

Item with discount rate (7%)	Inner-City Development	Fringe Development
Transport	\$206,542,055	\$342,598,098
Roads & Parking	\$46,937,535	\$154,826,095
Externalities	\$3,363,675	\$9,705,379
Total	\$256,843,265	\$507,129,572

Source: Newman and Kenworthy, 1999

Understanding the relationship between urban density and transport is important to ensuring proper planning decisions are made. There are transport related benefits of restricting sprawl, including:

- > Higher urban density increasing travel mode choice by reducing distances between places (such as shops/services and residential dwellings), therefore making alternative transport modes such as walking and cycling more viable. Figure 5.3 quantifies the distance tolerances that impact on walking and public transport choices.

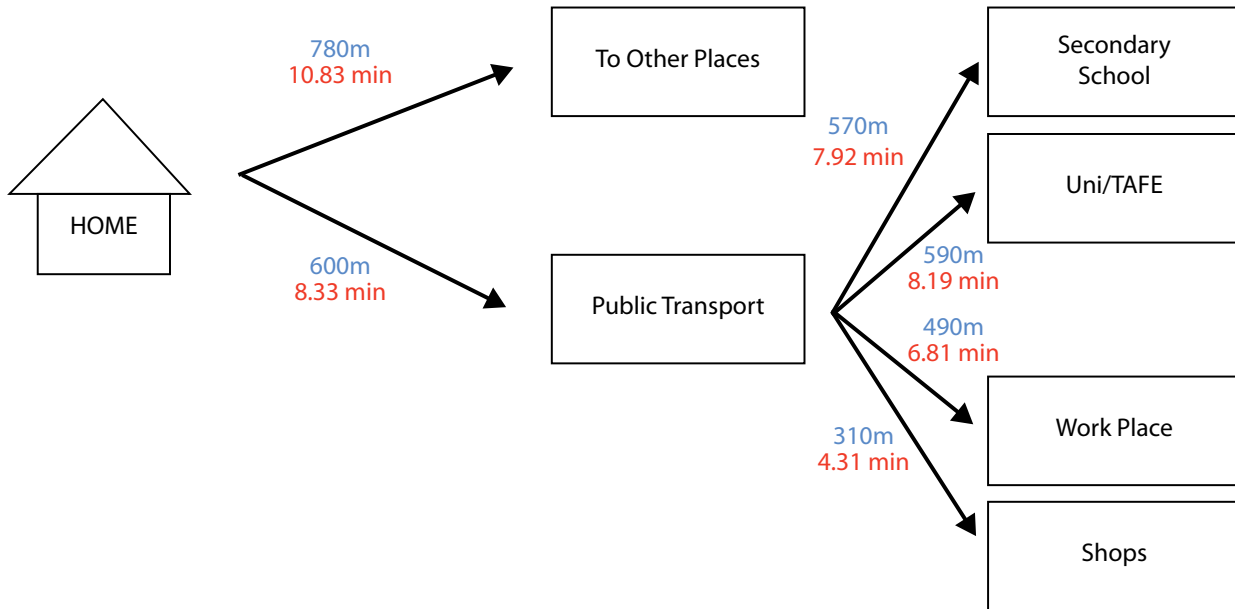
> According to the UK Urban Task Force, "...higher densities allow a greater number of public amenities and transport facilities to be located within walking distance, thus reducing the need for the car and promoting alternative modes or transport..."<sup>165</sup>

> Greater urban density leads to public transport routes having greater effective catchments and increased public transport accessibility. The link between urban density and public transport patronage is illustrated in Figure 5.4, which explains why cities with higher densities have a higher modal share of public transport.

<sup>165</sup> Urban Task Force, 1999, *Towards an Urban Renaissance: Report of the Urban Task Force*. Queen's Printer and Controller, UK.

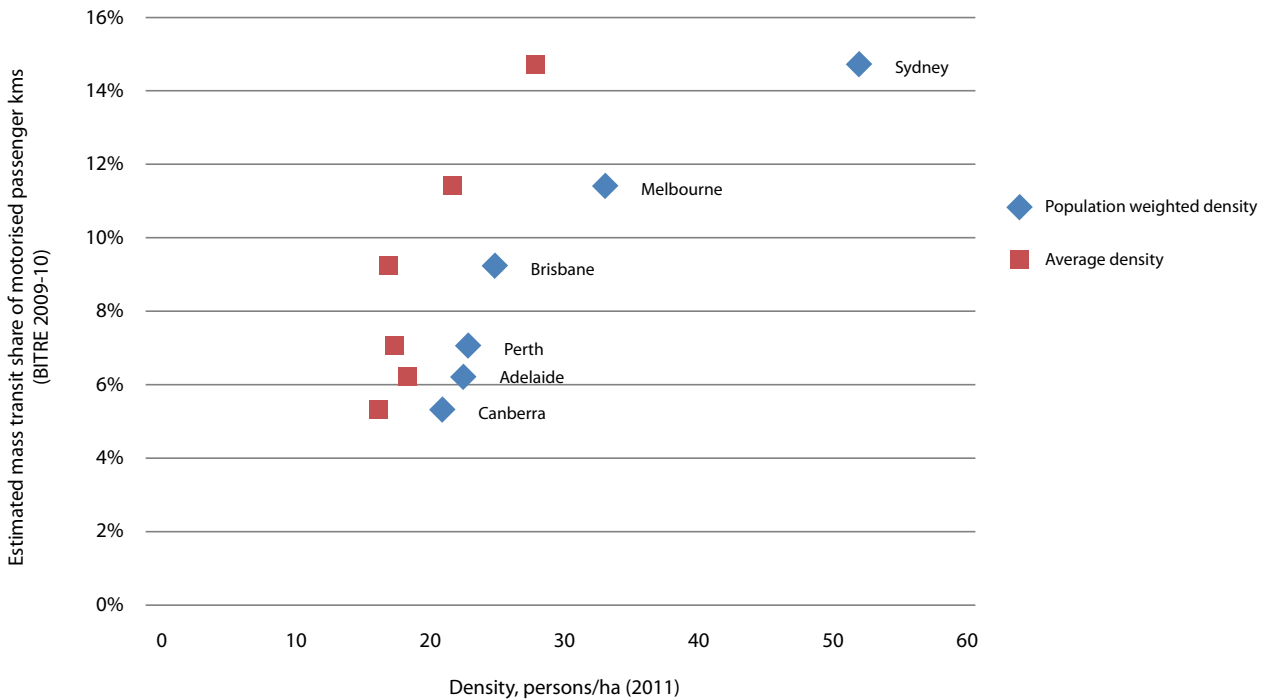


Figure 5.3: Average Distances People are Willing to Walk.



Source: Data interpreted from the 'Distances People Walk for Transport' Vol. 16, No. 3, September 2007, Road & Transport research report published by Matthew Burke and A.L. Brown. (Assumed walking speed of 1.2m per second was applied to calculate the walking time.)

Figure 5.4: Urban Density and Public Transport Patronage



Source: Comparing the residential densities of Australian cities (2011), accessed online at <http://chartingtransport.com/2012/10/19/comparing-the-residential-densities-of-australian-cities-2011/>

Most state governments have adopted planning policies to encourage greater urban consolidation and higher density residential development.<sup>166</sup>

The mechanisms for increasing urban densities require a co-ordinated approach, as this is the responsibility of multiple jurisdictions such as state governments (in the development of guiding policy and strategic vision) and local councils (through development plan or planning scheme requirements). One example of a strategic vision that attempts to address urban sprawl and effectively increase urban densities is the *30-Year Plan for Greater Adelaide*.

The *30-Year Plan* states that 70% of residential urban development over the next 30 years will occur within the existing urban boundary. This target aims to curb urban sprawl, but also to increase the effective urban density of Adelaide.

As a result councils responsible for creating and implementing planning schemes have started to incorporate policy mechanisms that encourage higher densities, such decreasing the size of allowable land parcels to encourage two-for-one infill development, or allowing increased building heights at strategic locations such as urban transport corridors.

Although these processes will take time to influence the effective density of cities and neighbourhoods, the decision to do so has been driven in part by the benefits to public and active transport mode share.

### 5.3 Mixed Land Use

The mix of land use is another feature of urban form that influences transport and movement.

Mixed use development can be defined as development that comprises a mixture of two or more land uses, either within a single building (horizontally or vertically) or across multiple buildings of different uses in a distinct development site.<sup>167</sup>

The scarcity of land for development within the inner

metro locations of Australian cities has necessitated:

1. Intensification of development
2. Consideration of mixed use development.

Such development encourages a range of land uses including residential, commercial, and industrial to be co-located. The integration of activities supports sustainable forms of transport such as public transport, walking and cycling, and increases neighbourhood amenity.

Mixed land use developments can enhance the economic vitality and perceived security of an area by increasing the number of people on the street and in public spaces. Key to financial viability of the site is the location of such opportunities within a comfortable walking and cycling distance of higher population densities that incorporates a mix of housing types and affordability.<sup>168</sup>

#### **Liveable Cities Program**

*The Australian Government developed the Liveable Cities Program to support state, territory and local governments in meeting the challenges of improving the quality of life in Australia's capital and major regional cities.*

*The Program was designed to strengthen partnerships between the levels of government to foster innovative solutions 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.*

*The Program built on existing investments and initiatives, thereby further aligning urban planning and design with the National Urban Policy and the COAG Capital Cities Planning Guidelines.*

*This has resulted in lasting partnerships between all levels of government and not-for-profit organisations and private interests.*

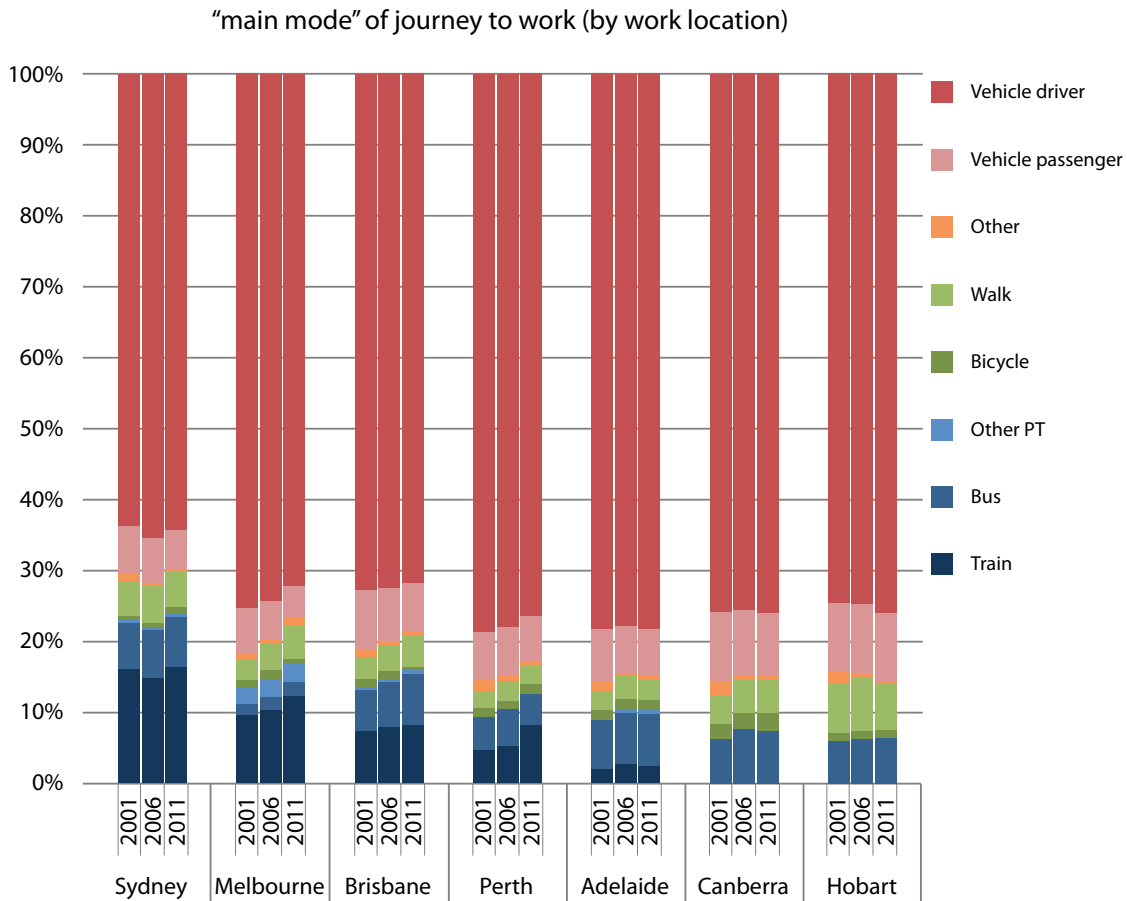
*Once completed, the funded projects will provide valuable lessons in achieving good planning outcomes that can be transferred and applied across the nation.*

166 Roberts, B, 2007, *Changes in Urban Density: Its Implications on the Sustainable Development of Australian Cities*. Accessed online at: <http://soac.fbe.unsw.edu.au/2007/SOAC/changesinurbandensity.pdf>

167 Adelaide City Council, *Guide to Mixed Use Development*, accessed online at [http://www.adelaidecitycouncil.com/assets/acc/Development/planning-building/docs/mixed\\_use\\_development\\_guide.pdf](http://www.adelaidecitycouncil.com/assets/acc/Development/planning-building/docs/mixed_use_development_guide.pdf)

168 Healthy Places & Spaces, 2009, *Design Principle Mixed Land Use*, accessed online at <http://www.healthyplaces.org.au/userfiles/file/Mixed%20Land%20Use%20June09.pdf>

Figure 5.5: Journey to Work Mode Share by City



Source: ABS (2001, 2006 and 2011 Census comparison)

**Recommendation:** Based on post delivery monitoring of existing Liveable Cities projects expand and increase funding to the Liveable Cities program.

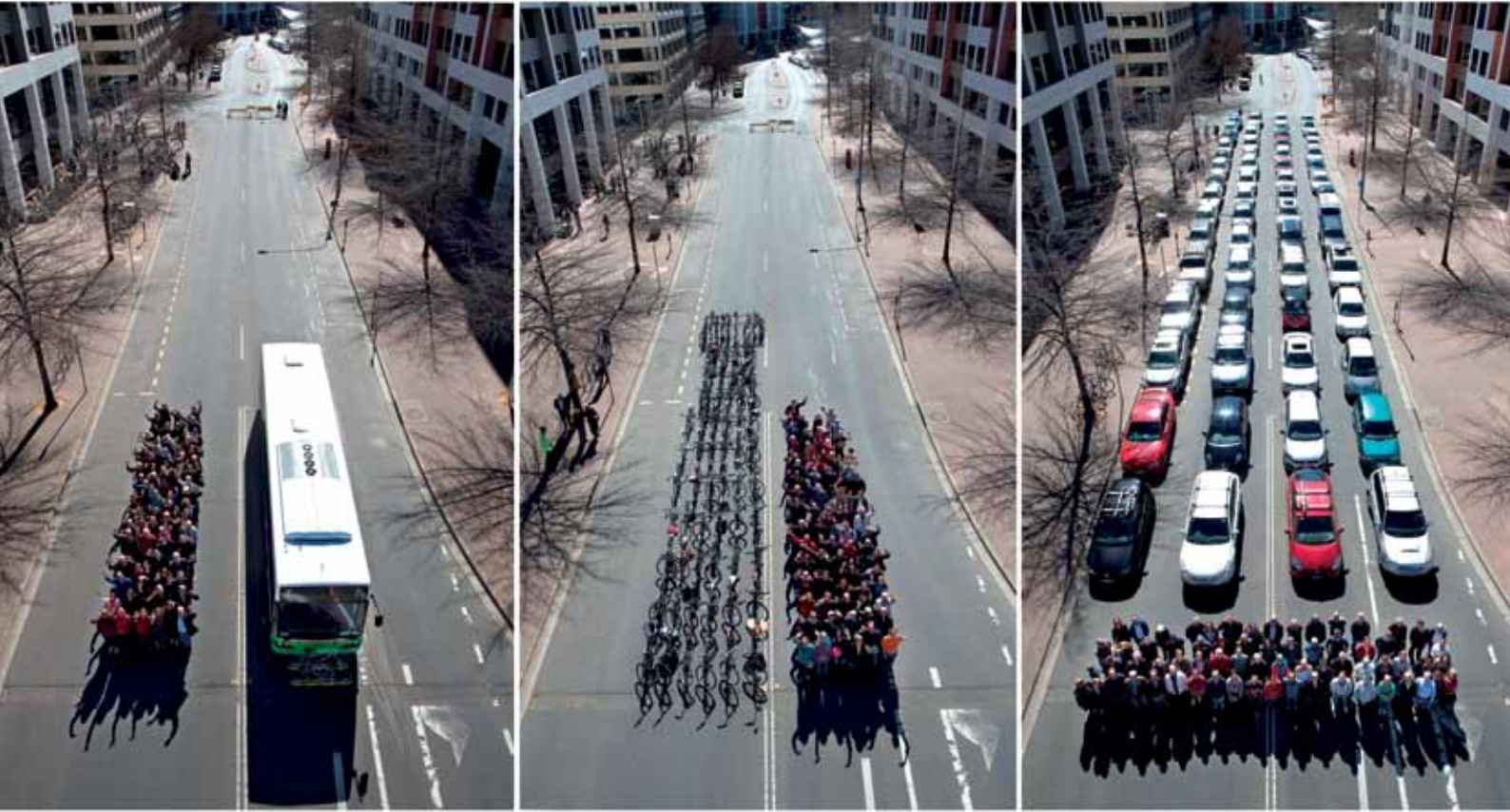
## 5.4 Urban Form: Promoting Travel Mode Choice

The urban form also plays an integral role in promoting travel mode choice. People travel by many different modes, including private vehicle, walking, cycling and public transport. Despite travel mode choice, the 2011 Census Journey to Work figures show that travel by private vehicle remains the dominant mode in each capital city, and accounts for approximately 75% of mode share, with very little shift between Census years. (See Figure 5.5.)

As previously indicated in this chapter, higher urban densities and mixed use development promote the potential for travel mode choice. The urban design transport space and the adjacent built form also plays an integral role in promoting travel mode choice (this is explored in section 5.6 of this report). The benefits of a multi-modal transport systems, or at least systems that are not private-vehicle-dominated, as outlined in the *Draft Discussion Paper: Walking, Riding and Access to Public Transport* from the Australian Government Department of Infrastructure and Transport are:<sup>169</sup>

- > increased capacity in the transport network and reduced local traffic congestion
- > improved public health and reduced healthcare costs

<sup>169</sup> Department of Infrastructure and Transport, 2012, *Draft Discussion Paper: Walking, Riding and Access to Public Transport*, Australian Government, Canberra.



Courtesy: Cycling Promotion Fund

*In the space it takes to accommodate 60 cars, cities can accommodate around sixteen buses or more than 600 bikes*

- > improved community wellbeing and social cohesiveness, and increased social interaction
- > reduced environmental impacts
- > reduced household costs.

Although private vehicle travel has led to significant transport efficiencies within our cities and towns, there has been a propensity for transport decisions to be too focused on accommodating vehicle movements, often to the detriment of other modes. Given the prevalence of the motor vehicle as Australians' 'mode of choice', government infrastructure spending and funding has been channelled towards roads and vehicle related infrastructure. Therefore a smaller portion has been attributed to walking and cycling infrastructure.

Given the benefits for individuals and communities using alternative modes of transport, a greater emphasis on the integration of land use and public transport planning should be embraced by all levels of government and their agencies.

This position on sustainable transport modes is supported by the OECD (albeit in the context of walking), who state:

*"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."*<sup>170</sup>

## 5.5 Car Parking

There are many other features of planning that influence transport and people movement. Car parking policy is one such example. A large amount of parking space is afforded to cars, both on local road networks and within developments.

The question should be raised as to whether this is the most effective use of space, and whether underlying

opportunities are being lost by providing too much space for parking. An obstacle in achieving higher densities (or mixed use development) is the required parking rates specified in development plans and development schemes.

Within some jurisdictions, there has been a shift in planning policy that has seen decision makers considering reductions in the required parking spaces for development. For example the City of Yarra has developed a parking policy that allows for no car developments or a substantially reduced car parking developments.<sup>171</sup>

Car parking controls as a Travel Demand Management (TDM) tool are explored in section 2.3.5 of this report.

## 5.6 Urban Design Principles

Good transport decisions can lead to beneficial land use outcomes. In the context of Australian cities, planning concepts that embody the above characteristics of urban form that promote the integration of transport include:

- > Primarily, Transport-Oriented Developments (TOD's) are activity centres established around transport nodes. They combine a broad mixture of land uses, including medium to high density housing, employment, retail, commercial and community facilities, with accessible, frequent and safe transport services to reduce the need for outside travel and create attractive and vibrant communities with a strong 'sense of place'. TODs are also pedestrian focussed, providing an extensive network of walking and cycling linkages to enhance accessibility to all activities, services and transit stops within the area.<sup>172</sup> TOD's and recommendations are discussed in Section 1.3 of this report.
- > An activity corridor or main street is a street or street section that contains mixed-uses (such as shops, services, offices, cafes, restaurants, bars, cinemas, open spaces, etc) that enable social interaction and attract customers of the local and wider community. Attraction to main streets is generated by the mixed

<sup>170</sup> Organisation of Economic Cooperation and Development (OECD) 2011, *Pedestrian Safety, Urban Space and Health: summary document*, International Transport Forum 2011, Leipzig, Germany.

<sup>171</sup> Yarra City Council, 2010, *Parking Strategy*, Accessed online at: <http://www.yarracity.vic.gov.au/Parking-roads-and-transport/Improving-Parking/Parking-strategy/>

<sup>172</sup> Planning Institute of Australia: *Transit Oriented Development Policy Position Statement*, Planning Institute of Australia, Canberra, accessed online at <http://www.planning.org.au/documents/item/277>.



uses and facilitated by strong connections to local transport networks

- > *Liveable Neighbourhoods* is an operational policy of the Western Australian Planning Commission which applies to structure planning for greenfield sites. The 12 aims of Liveable Neighbourhoods are multifaceted, however, incorporating land use and transport integration is an integral aspect of fostering a sense of community and strong local identity. In this, the principles of Liveable Neighbourhoods demonstrate that transport and land use decisions encompass much wider fields than just the transport and urban planning and incorporate the social, economic and health needs of communities
- > *Healthy Spaces and Places*<sup>173</sup> supports and complements planning and design initiatives throughout Australia. It is a single source of easy-to-find, practical information from experts in health, planning, urban design, community safety and transport planning.

This website includes:

- design principles that are the foundation stones of healthier more active communities
- different development types where these principles can be applied
- information about how to make planning for healthier communities happen
- Australian case studies that show what is achievable and which have potentially wider application, and
- links to the health and planning research and resources that support planning for active living.

## 5.7 Implementing Transport and Land Use Integration

As previously stated, planning for transport and land use should not be undertaken in isolation given that the decisions we make about transport can influence urban form, and vice versa. Planning for a transport network requires consideration of the way in which it is integrated with the built form. Likewise, decisions on the location,

scale, density and design of the built form will have a significant influence on the purpose and function of a transport network.

Transport and land use decisions are made across many levels of government. As a consequence it is important to promote and develop linked transport planning processes that fully integrate with land use planning and are coordinated, innovative and include financial commitments from all levels of government and key stakeholders.

### **Case Study: Integrated decision making under the Transport Integration Act 2010 (Victoria)**

*The Transport Integration Act 2010 enshrines in legislation a framework for integrated and sustainable transport setting out a vision, set of objectives and decision-making principles for the transport system in Victoria. Under the Act, certain planning bodies are defined as “interface bodies”. An interface body is required to have regard to the transport system vision, objectives and decision-making principles when making decisions that are likely to have a significant impact on the transport system. An example of an interface body is a local council determining municipal strategic statement under the relevant planning scheme. The under the Transport Integration Act provides a mechanism to achieve integrated decision making between bodies that affect transport and land use outcomes.*

### **Recommendation: Establish an Australian Government portfolio which will:**

- > *Integrate land use and transport planning considerations at an Australian Government level.*
- > *Oversee the adoption and implementation of Capital Cities Planning Criteria agreed to by the Council of Australian Governments.*
- > *Oversee the delivery of an expanded Liveable Cities program funding and set of projects.*
- > *Add reference to regional centres*
- > *Through research and evidence gathering, assist State and Local Governments to improve structure and concept planning for new land development areas to reflect best practice in integrated land use and transport planning.*

173 See [www.healthyplaces.org.au](http://www.healthyplaces.org.au)



*Physical inactivity costs  
Australia \$13.8 billion a year*

# ***CHAPTER 6***





# OUR TRANSPORT SYSTEM IN 2030: A HEALTHY AND ACTIVE AUSTRALIA

*The Taskforce recognises that improving the efficiency of the transport system by investing in planning, promoting walking, cycling and public transport use, and creating a truly integrated multi-modal transport network will have significant health, environmental, social, equity and economic benefits and is vital to building a healthy nation.*

This chapter explores:

- > the health impact of the current transport system
- > the potential of active travel and its role in an integrated transport system
- > the role of active travel in the transport system
- > the transport needs of different segments in the community with no or limited access to private transport such as children, young people and older Australians
- > recommendations to achieve the potential of walking and cycling as part of an integrated multi-modal transport system.

## 6.1 The Health Impact of our Current Transport System

### 6.1.1 Transport and Wellbeing

Physical inactivity costs Australia \$13.8 billion a year (KPMG Econtech 2008). The direct annual health care cost incurred to treat the symptoms of inactivity was estimated to be \$719 million in 2007-08, and it is estimated that 16,178 Australians die prematurely each year due to physical inactivity.<sup>174</sup>

Physical inactivity is a major contributor to the burden of chronic disease, including cardiovascular disease,

and is an important driver of the overweight/obesity epidemic.<sup>175</sup>

Despite greater understanding of the significant health burden of physical inactivity, it remains disturbingly prevalent in Australia.<sup>176</sup>

The Heart Foundation has developed a Blueprint for an Active Australia<sup>177</sup> outlining key action areas required to increase population wide physical activity levels to achieve community wide benefits in health, the environment, social policy and the economy.

Both the Blueprint for an Active Australia and the Australian Government's National Preventative Health Strategy<sup>178</sup> have recognised that increasing walking and cycling for transport has significant potential to boost physical activity levels in Australia, but requires investment, cooperation, coordination and collaboration between different levels of government and other sectors, including transport.

*Across the developed world, there are a number of constant factors in travel behaviour, which have not changed noticeably in decades. Among these are that most car journeys are short enough to be walked or cycled.*

**Take action on active travel, Sustrans, UK 2008**

174 Medibank Private, 2008, *The Cost of Physical Inactivity*, Medibank Private Limited, accessed online at [http://www.medibank.com.au/Client/Documents/Pdfs/The\\_Cost\\_Of\\_Physical\\_Inactivity\\_08.pdf](http://www.medibank.com.au/Client/Documents/Pdfs/The_Cost_Of_Physical_Inactivity_08.pdf)

175 National Heart Foundation, *Blueprint for an Active Australia Key Government and Community Actions Required to Increase Population Levels of Physical Activity in Australia – 2010-2013*, National Heart Foundation, Melbourne.

176 Australian Bureau of Statistics, 2011, *Perspectives on Sport 2011*, Australian Government, Canberra.

177 National Heart Foundation, *Blueprint for an Active Australia*

178 Preventative Health Taskforce, 2009, *National Preventative Health Strategy*, Australian Government, Canberra.

The National Physical Activity Guidelines for Australians recommend 30 minutes of moderate intensity physical activity on most days as the minimum requirement for good health.

Given time is one of the biggest barriers to participation in physical activity, integrating physical activity into daily routines such as commuting between home and work or home and school is increasingly regarded as an effective strategy to increase and maintain population-wide physical activity levels.<sup>179</sup>

A recent national survey found that those people who cycled for transport averaged 276 minutes riding a week,<sup>180</sup> thereby meeting the minimum physical activity requirement for good health from their transport journeys alone.

The Australian health care system could save \$1.5 billion annually if more people were physically active for 30 minutes a day.<sup>181</sup>

The transport system has significant potential to make a considerable contribution to boosting physical activity levels by optimising the role of active travel to reduce the burden on our health budget, and at the same time increasing the efficiency of the road network.

It is increasingly recognised that the transport system affects the health and wellbeing of the whole population both directly and indirectly.

Where people live can affect physical and mental health. Factors include available transport choices; access to open and green space, footpaths and trails; availability of local services; opportunities to exercise; and opportunities for social interaction.<sup>182</sup>

Urban living has both risks and benefits for human health. A comprehensive review of literature concerned with the relationship between population health and built environment (Kent et al 2011) has identified physical activity and social interaction as significant domains of

the built environment that support human health:<sup>183</sup>

- > Physical activity – getting people active for travel and recreation
- > Social interaction – connecting and strengthening communities through incidental interaction, planning and building community spaces and designing for crime prevention.

Both factors are strongly linked to transport and access.

### 6.1.2 Potential Health Benefits of an Integrated Multi-Modal Transport System

There is increasing evidence that creating more connected and liveable neighbourhoods has the potential to reduce some of the negative health impacts of the transport system, and produce significant health and sustainability benefits.<sup>184</sup>

The planning section of this report examines how planning is able to encourage and support active living by making walking and cycling an easier and convenient choice, reducing car use for short trips, improving access to local services as well as facilitating more efficient land use.

A number of methodologies have recently been developed to quantify and monetise the benefits of increasing active transport and active travel in particular.<sup>185</sup>

Most of the methodologies consider the following benefits of increasing active travel:

- > Reduced health care costs
- > Increased capacity of the transport network

179 Garrard, J, 2009, *Active Transport, Children and Young People: An Overview of Recent Evidence*, Vic Health, Victorian Government, Melbourne.

180 Austroads and Australian Bicycle Council, 2011, *Australian Cycling Participation: Report for the National Cycling Strategy 2011-16*.

181 Medibank Private, 2008, *The Cost of Physical Inactivity*, Medibank Private Limited, accessed online at: [http://www.medibank.com.au/Client/Documents/Pdfs/The\\_Cost\\_Of\\_Physical\\_Inactivity\\_08.pdf](http://www.medibank.com.au/Client/Documents/Pdfs/The_Cost_Of_Physical_Inactivity_08.pdf)

182 Turrell et al, 2010, "Addressing Sustainable Living Using a Collaborative Approach and Multi-disciplinary Techniques," *The International Journal of Climate Change: Impacts and Responses*, 2(3), pp. 77-86.

183 Kent et al, 2011, *Healthy Built Environments: A Review of Literature*, Healthy Built Environments Program, University of Sydney, NSW. Accessed online at <http://www.be.unsw.edu.au/research-centres-and-clusters/city-futures/about-us>

184 Heart Foundation, 2009, *Delivering Melbourne's Newest Sustainable Communities*, Submission to the Growth Areas Authority, Heart Foundation, Melbourne, accessed online at [http://www.parliament.vic.gov.au/images/stories/committees/osisdv/iugb/OSISDC\\_UGB\\_sub63\\_Att1\\_Heart\\_Foundation\\_12.10.09.pdf](http://www.parliament.vic.gov.au/images/stories/committees/osisdv/iugb/OSISDC_UGB_sub63_Att1_Heart_Foundation_12.10.09.pdf)

185 Kahlmeier, S, et al, 2011, *Health Economic Assessment Tool (HEAT) for Walking and Cycling*, World Health Organisation, Regional Office for Europe. Accessible online at: [http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0003/155631/E96097.pdf](http://www.euro.who.int/__data/assets/pdf_file/0003/155631/E96097.pdf)



- > Increased productivity
- > Reduced environmental impact (noise reduction, air quality)
- > Improved community wellbeing and social cohesion.

A 2011 study undertaken by Fishman et al into the cost and health benefits of active transport in Queensland puts the total value of active travel at:

- > 1km of walking \$2.10 benefits
- > 1km of cycling \$3.51 benefits.<sup>186</sup>

An analysis in the UK established a cost:benefit ratio of up to 37.6 for investments into improving walking environments and identified that investments to boost walking and cycling for transport represent excellent value, compared with other transport investments.<sup>187</sup>

Different methodologies assessing the monetary benefit of active travel vary slightly in relation to the monetary value per km travelled, but all methodologies agreed that the health benefit is the most significant benefit of walking and cycling trips.

Given physical inactivity is a major contributor to the burden of chronic disease including cardiovascular disease and diabetes, and an important driver of the epidemic of overweight and obesity, increasing walking and cycling trips has the potential to significantly reduce the burden of preventable disease in Australia.<sup>188</sup>

**Case Study: Active Travel and Health**

*(Furie & Desai, American Journal of Preventive Medicine 2012;43(6):621– 628) December 2012)*

*A recent study confirms what we have known for many years, that transport and planning issues are also health issues. Promoting walking, cycling and public transport is a strategy to reduce population levels of obesity as well as risk and burden of cardiovascular disease and type 2 diabetes.*

*A study of American adults published in December 2012 shows that:*

- > *Compared to drivers, mean body mass index was lower among individuals with low and high levels of active transport*
- > *Waist circumference was lower*
- > *The odds of hypertension were 24% lower and 31% lower among individuals with low and high levels of active transportation*
- > *High active transportation was associated with 31% lower odds of diabetes.*

*Active travel was associated with more-favourable cardiovascular risk factor profiles, providing additional justification for infrastructure and policies that permit and encourage active transport. Public transport users also walk more often as the train or bus is a 'linked' trip with a walk or cycle at each end.*

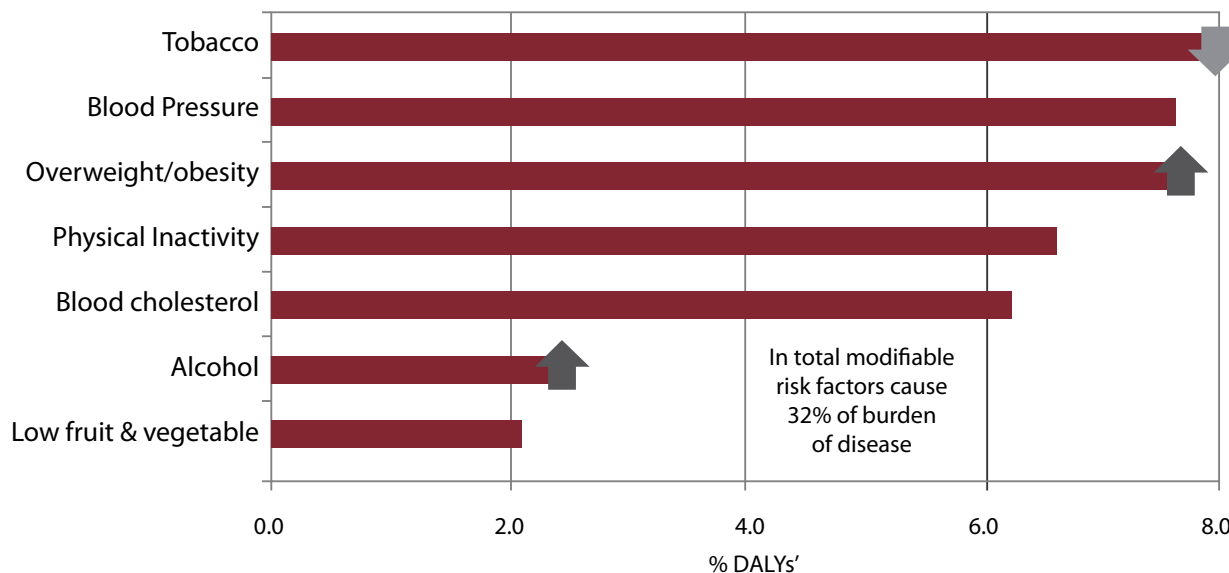
**Recommendation: Incorporate health benefit factors in cost benefit frameworks for all federally funded transport projects.**

**6.1.3 Negative Health Impacts of the Current Transport System**

Transport provides many benefits to society, but also generates some negative environmental and health impacts. This section outlines some of the negative health impacts of our current land transport system.

<sup>186</sup> Fishman, E, et al, 2011, *Cost and Health Benefit of Active Transport in Queensland*, Stage Report: Research and Review for Health Promotion Queensland, Queensland Government, Brisbane.  
<sup>187</sup> University of the West of England and Cavill & Associates, 2011, *Making the Case for Investment in the Walking Environment: A Review of Evidence*, University of the West of England, Bristol.  
<sup>188</sup> Connelly, J, 2007, "Preventing Overweight and Obesity in Children: Physical Activity is the Key Factor," *Review of Endocrinology*, July 2007.

Figure 6.1: Keys to Prevention: Top Seven Selected Risk Factors and the Burden of Disease



Source: AIHW (adapted from *Australia's Health 2008* Table 4.1)

### 6.1.3.1 Physical Inactivity

The increase in private motorised transport in Australia over the past four decades has coincided with a significant decline in physical activity in the community. In 2008, 33.5% of Australia's adults were physically inactive.<sup>189</sup> A range of factors influence physical activity levels. There is increasing understanding of the impact the decline in incidental physical activity such as walking and cycling for transport has had on population wide physical activity levels. Countries which have maintained high levels of walking and cycling have seen significantly smaller declines in physical activity levels than Australia.<sup>190</sup>

### 6.1.3.2 Air Pollution

Urban air pollution is estimated to account for one per cent of the disease burden in Australia, and more than 3,000 premature deaths, mainly among the elderly. It contributes to respiratory and cardiovascular diseases and cancer. Motor vehicle air pollution is estimated to cause up to 4,500 cases of respiratory and cardiovascular disease each year, and the estimated

cost of air pollution in Australian capital cities in 2005 was more than \$2 billion.<sup>191</sup>

### 6.1.3.3 Road Trauma

On average, four people are killed and 90 are seriously injured every day on Australia's roads. Almost everyone has, at some stage, been affected by road trauma. The annual economic cost of road accidents in Australia is enormous—estimated at \$27b per annum—and the social impacts are devastating.<sup>192</sup> Speed and road trauma are positively correlated. Research suggests the City of Melbourne's decision to reduce the CBD speed limit to 40 km/hr (from 50 km/hr) would prevent, on average, one fatality and nine serious accidents each year.<sup>193</sup>

189 Australian Bureau of Statistics, 2011, *Physical Activity in Australia: A Snapshot 2007-2008*, Australian Government Canberra.

190 Pucher, J, and Dijkstra, L, 2003, "Promoting Safe Walking and Cycling to Improve Public Health: Lessons from the Netherlands and Germany", *American Journal of Public Health*, Vol. 93, No. 9, September 2003.

191 Department of Sustainability, Environment, Water, Population and Communities, 2011, *State of the Environment 2011: Independent Report to the Government Minister for Sustainability, Environment, Water, Population and Communities*, Australian Government, Canberra. Accessible online at: <http://www.environment.gov.au/soe/2011/index.html>

192 [This figure is based on a willingness to pay methodology] Australian Transport Council, 2011, *National Road Safety Strategy 2011-2020*. Australian Government, Canberra.

193 <http://news.drive.com.au/drive/roads-and-traffic/city-speed-limits-drop-to-40kmh-20120921-26aoo.html>

#### 6.1.3.4 Traffic Noise

Exposure to excessive noise has been shown to cause hearing problems, stress, poor concentration, productivity losses in the workplace, communication difficulties, fatigue from lack of sleep, and a loss of psychological well-being. Increasingly, housing developments are constructed along transport corridors, and no studies have been undertaken to measure the noise impact on residents. Australia currently does not have an agreed national standard for regulations/policies regarding noise in urban areas.

Noise at home or school can affect children's ability to learn. Compared to those from quieter neighbourhoods, children living near airports or busy highways tend to have lower reading scores, and develop language skills more slowly.<sup>194</sup>

#### 6.1.3.5 Social Exclusion

The current transport system, which relies heavily on private cars, has resulted in increasing social exclusion for people with no or limited access to a private motor vehicle, such as young and older people, students, people on low incomes and people with disabilities.

In addition, an increasing number of households with access to private cars are facing significant financial pressure, with some households on the fringes of Melbourne spending more than 50% of their total income on operating two or more cars to access employment, services and family.<sup>195</sup>

Every transport system generates some negative impacts; the challenge is to minimise the negative impacts of the transport system and maintain and improve transport outcomes. It is increasingly recognized that optimising the potential of different transport modes can play a significant role in reducing the negative impacts of the transport system and improve its efficiency.

The following section examines some of the opportunities active travel can provide in reducing the health impact of the transport system, improving mobility

choices and getting more Australians active.

## 6.2 Potential of Active Transport and its Role in an Integrated Transport System

Recent research has shown a flattening of growth in passenger vehicle kilometres travelled in capital cities, suggesting there may be a limit to growth in per capita private car travel.<sup>196</sup>

The following section examines some trends in Australia that provide significant opportunities for public and active transport modes to improve the efficiency and effectiveness of the transport system by 2030.

### 6.2.1 Growing Demand for Public and Active Transport

Most capital cities in Australia have seen a significant increase in demand for public transport services over the last few years from people seeking more convenient, affordable and faster transport options.

Recent research by the Bus Association in Victoria has found that people in Melbourne who use public transport are also likely to get their recommended daily dose of physical activity during their travel. It found that people using public transport on a particular day also spent an average of 41 minutes walking and/or cycling as part of their travel.<sup>197</sup> Given this data, it appears likely that most regular public transport users get enough incidental exercise to maintain their general health.

Boosting public transport use in Australia not only reduces pressure on congested road networks, it also has significant potential to increase physical activity levels, improve mobility and reduce emissions.

### 6.2.2 Population Growth and Changes

Population growth and demographic changes have resulted in significant population growth in capital cities, with more than 14.5 million people, close to two-thirds

194 Bronzaft, A, 1998, "Effects of Noise", *Encyclopedia of Environmental Science and Engineering*. J.R. Pfafflin & E. N. Ziegler (Eds), Gordon and Breach Science Publishers, 1998

195 Currie, G, et al, 2009, "Investigating Links Between Transport Disadvantage, Social Exclusion and Well-Being in Melbourne — Preliminary results", *Transport Policy* 16 (3), 97.

196 BITRE, 2011, *Road Vehicle-Kilometres Travelled: Estimation from State and Territory Fuel Sales*, Report 124, Australian Government, Canberra.

197 Bus Association of Victoria, 2010, *Public Transport Use a Ticket to Health*, Bus Association of Victoria, Melbourne.

of Australia’s population, living in a capital city statistical division. The growth is happening in inner city local government areas (LGA’s), and on the fringes of the capital cities, within some LGA’s such as Wyndham in Victoria growing by 7.8% or 12,200 people in 12 months.

This provides challenges and opportunities for active and public transport and travel.

### 6.2.3 Population Growth in Inner City Areas

Many councils and state governments have encouraged higher density housing along transport corridors to manage travel demand. In addition, there is an increasing trend towards inner-city living and increased urban density. Building approvals for higher density homes, including apartments, increased by 127% over the past three financial years in Melbourne and in 2010-11 accounted for 25% of residential building approvals in Australia.<sup>198</sup>

Recent trends in the growth of public transport use in capital cities around Australia highlight higher density living and population growth along transport corridors is an effective strategy to reduce pressure on the road network and boost public transport use, but requires public transport service frequency and capacity to be increased to cope with the resulting growth in demand.

### 6.2.4 Population Growth at the Fringes of our Cities

The rapid growth at the fringes of our cities provides Australia with the biggest transport challenge. If not addressed urgently, this will have serious economic, social and environmental consequences.

There is increasing evidence, both in Australia and internationally, that highlights the link between the built environment, access to transport and services and health outcomes. There is also increasing awareness of the growing inequality of health outcomes not only based on socio economic indicators but also location.<sup>199</sup>

Below is an extract from the submission by Wyndham

City Council (2011), the fastest growing LGA in Victoria and the fourth fastest growing in Australia, to “Our Cities – A National Urban Policy Inquiry.”

**Recommendation: Fund and expand initiatives that incorporate health in urban planning to create healthy and sustainable outcomes. Develop and fund a national active travel strategy embracing walking, cycling and public transport, building on recommendations of the Walking, Riding and Public Transport discussion paper (2012).**

### 6.2.5 Doing Not So Well

There are continuing concerns regarding differing distribution of transport-related benefits across geographic areas. Consistently, the health and wellbeing of communities in Melbourne’s outer suburban growth areas is worse than state and national averages. Specifically, there are emerging concerns regarding declining public health in areas such as obesity, diabetes and some cancers.

### 6.2.6 Other Public Health Issues

The Wyndham case study highlights the challenges faced by many communities at the fringes of our cities with intersection factors such as poor public transport infrastructure, a higher proportion of low income households and the need to travel further distances to access services and employment.

The huge population growth at the fringes of our cities provides significant challenges and opportunities for all levels of government. Without action to improve public transport access in these areas, the economic, social and health implications will be significant, not only increasing the burden on individuals and their families, but for future generations and governments.

## 6.3 The Role of Active Travel in the Transport System

### 6.3.1 Walking as a Transport Mode

Walking is the most common form of transport; nearly everyone is a pedestrian for part of their trip, even if they are driving. Despite this, walking as a means of

<sup>198</sup> Australian Bureau of Statistics, 2011, Building Approvals Australia, Australian Government, Canberra.  
<sup>199</sup> Legislative Council Environment and Planning Reference Committee, 2012, Inquiry into Environmental Design and Public Health in Victoria, Victorian Government, Melbourne.

transport is often overlooked and neglected.

Less than one in five (18.7 per cent) of trips to work or study in Australia which are less than 5km are currently made by walking.<sup>200</sup> Just 6.7 per cent of commuters to the CBD in Sydney walk to work. But 93% of all internal trips within the City of Sydney are walking trips,<sup>201</sup> while 49.2 per cent of day to day trips other than for work or full time study are made by foot in Melbourne, with people over 60 and young people between 11 and 20 making the most walking trips.<sup>202</sup>

The National Heart Foundation has identified walking as an effective way to increase levels of physical activity, as it can be easily incorporated into daily activities, and research consistently finds that walking is popular among adults, particularly women and people in low socioeconomic groups.<sup>203</sup>

Walking plays a vital role in an integrated multi-modal transport system. Making walking safer, easier and more convenient has significant potential to boost the mode share of walking in our cities and neighbourhoods, providing benefits for individuals, communities, governments and the health system.

There is enormous potential to increase participation in walking.

### 6.3.2 Cycling as a Transport Mode

Cycling and walking trips have grown in most capital cities in Australia due to demographic and urban changes, congestion, crowding on public transport and a greater awareness of the benefits and convenience of cycling.

According to a recent survey, 1.2 million people made at least one transport journey by bicycle a week, which included trips to work, school, university, shops or visits to family or friends.<sup>204</sup>

Data from Sydney, Melbourne, Brisbane, Perth and

Adelaide show an annual increase up to 18.3 per cent on main cycle routes leading into the CBD between 2005 and 2009. This growth has happened with limited investment in improving safety, convenience or amenity. The National Cycling Strategy 2011 to 2016 aims to double the number of people cycling in Australia by 2016.<sup>205</sup>

To measure performance towards this target, research was commissioned to obtain base line data on cycling participation in Australia. The survey found that in a typical week around 18 per cent of Australians ride a bicycle for transport and recreation, with around 3.6 million people riding for recreation, leisure or sport.<sup>206</sup>

A recent national survey found that 60 per cent of Australians have access to a bicycle, but 70 per cent of those were not considering cycling for transport in the near future, even though more than half would like to. The biggest barriers were identified as unsafe road conditions, speed/volume of traffic, safety and lack of bicycle lanes/trails. More than 80 per cent of people surveyed believe government should be doing more to promote a safe cycling culture, and more than 60 per cent wanted government to do more to encourage people to ride to work, and to offer incentives to get more people to use bicycles for transport.<sup>207</sup>

Achieving the target of doubling the number of people cycling by 2016 would mean an additional 1.2 million people riding for transport. The combination of higher density living close to activity centres, increased availability of bicycle parking provided in new apartments and workplaces, and greater awareness of the health benefits of active travel, provides significant opportunities to boost cycling for every day trips, by making cycling convenient and safe.

The following section outlines the potential for increasing cycling and walking trips for commuting, day to day trips and accessing public transport, to achieve an active and public transport mode share of 30 per cent by 2030.

200 Australian Bureau of Statistics, 2008, *Public Transport Use for Work and Study*, Australian Government, Canberra.

201 City of Sydney, 2012, City Research. Accessed online at <http://www.cityofsydney.nsw.gov.au/AboutSydney/CityResearch/Default.asp>

202 Australian Bureau of Statistics, 2008, *Public Transport Use for Work and Study*, Australian Government, Canberra.

203 Bauman et al, 2009, *Position Statement: The Built Environment and Walking*, National Heart Foundation, Melbourne.

204 Austroads and Australian Bicycle Council, 2011, *Australian Cycling Participation: Report for the National Cycling Strategy 2011-16*.

205 Austroads and Australian Bicycle Council, 2011, *Australian Cycling Participation: Report for the National Cycling Strategy 2011-16*.

206 Austroads and Australian Bicycle Council, 2011, *Australian Cycling Participation: Report for the National Cycling Strategy 2011-16*.

207 National Heart Foundation and Cycling Promotion Fund, 2012, *Riding a Bike for Transport: 2011 Survey Findings*.



### 6.3.3 Cycling and Walking for Commuting Trips

Despite the myth that distances in Australia are large, and therefore walking and cycling rates are low, around a fifth of the adult population travels less than five kilometres to work or study.

In capital cities, 15.3 per cent of commuters travel less than five kilometres (an ideal cycling distance).<sup>208</sup> Interestingly, as much as 70 per cent of trips to work or study of less than five kilometres are currently made by car.<sup>209</sup>

Transport choices are influenced by trip costs, time and convenience. Cycling for trips less than 5 km and walking trips less than 2 km are the most cost effective transport options for individuals, and in congested urban areas those modes are often faster than other alternatives. Making active travel more convenient and safe has the potential to significantly increase the number of cycling and walking trips in major cities, particularly in areas of significant congestion and pressure on existing public transport services.

**Recommendation:** Provide sustained infrastructure funding that supports active travel (for example, renew and expand the \$40 million National Bike Path program) and require all federally-funded state/territory transport infrastructure projects to incorporate or enhance active travel where feasible.

**Recommendation:** Establish an active travel office to coordinate and manage the active travel strategy.

**Recommendation:** Establish and support a walking, riding and access to public transport council to provide advice to Transport Ministers and the Standing Council on Transport and Infrastructure.

**Recommendation:** Require all federally funded state/territory transport infrastructure projects to incorporate or enhance active travel where feasible.

**Recommendation:** Provide financial incentives (tax and price) to make walking, cycling and public transport cheaper and easier choices.

### 6.3.4 Cycling and Walking for Day to Day Trips

Day to day trips such as shopping, accessing services including school and university and recreation and leisure opportunities are often short, and have significant potential for walking and cycling.

Walking is used as the primary transport mode by many for day to day trips other than work or study with the highest proportion of walking trips in Melbourne and the lowest in Brisbane.<sup>210</sup>

Evidence suggests that the design of activity centres and neighbourhood streets significantly influence people's travel choice. It is interesting to note that there are considerable differences in how people access shops and services between cities, and even within cities.

A recent discussion paper published by the Heart Foundation confirmed that destinations which have invested in streetscape enhancements to make them more attractive for pedestrians and bicycle riders have seen some significant benefits, including boosting small

208 Australian Bureau of Statistics, 2008, *Public Transport Use for Work and Study*, Australian Government, Canberra

209 Australian Bureau of Statistics, 2007, *Environmental Issues: People's Views and Practices*, Australian Government, Canberra.

210 Australian Bureau of Statistics, 2008, *Public Transport Use for Work and Study*, Australian Government, Canberra.



business turnover, increase in the value of properties, and improved viability and vitality of areas.<sup>211</sup>

Given many small retailers in Australia are struggling, improving access and amenity for pedestrians and bicycle riders to local activity centres has the potential to boost walking and cycling trips, reduce pressure on the road system and demand on parking, as well as boost economic vitality and support local retailers.

### 6.3.5 Walking and Cycling as a Link in the Public Transport System

Developing an integrated transport network for moving people requires that modes seamlessly connect, making journeys convenient and intuitive. Improving access by walking and cycling to public transport stops and stations is a cost effective way to expand the catchment of public transport.

Unfortunately many stations and public transport stops, instead of facilitating easy access by walking and cycling, have significant barriers to easy, convenient and safe access.

The Victorian Department of Transport has established a “Station User Panel” to develop some usability principles

to ensure stations are accessible, easy to navigate, comfortable, safe and integrated with surrounding areas.<sup>212</sup>

There is significant potential to increase cycling and walking trips to provide vital links to public transport interchanges, by improving access and convenience to enable commuters to seamlessly connect between different modes.

**Recommendation:** All governments should work with active travel stakeholders to improve integration between cycling, walking and public transport.

## 6.4 People with Limited Access to Transport

Transport disadvantage is experienced by specific sub-groups in the population such as young people, families with young children, unemployed people, those on low income, seniors, culturally and linguistically diverse people, indigenous Australians, and people with

211 National Heart Foundation, 2011, Good for Business: The Benefits of Making Streets More Walking and Cycling Friendly – Discussion Paper, National Heart Foundation, Melbourne.

212 Department of Transport Victoria, 2012, Railway Station Useability Principles: Prepared by the Station User Panel, Victorian Government, Melbourne.

disabilities. It is also common in specific geographic locations such as outer urban areas and rural and remote Australia.<sup>213</sup>

The links between transport disadvantage and social disadvantage are complex, and require a range of policy responses. This paper is not able to examine in detail transport disadvantage and strategies to overcome it, but it aims to highlight some common barriers faced by older Australians, children and young people in accessing essential services and recreation and leisure services, and makes recommendations on effective strategies to overcome them.

#### 6.4.1 Older Australians and Mobility

In 2007 the population of people between 65 and 84 years of age was 2.4 million, and it is projected the number of people in this age group will grow to 4 million by 2022. The number of people 85 years and over is also projected to increase rapidly, from 344,000 in 2007 to 1.7 million in 2056.<sup>214</sup>

Research into transport and mobility needs of older Australians undertaken by the NRMA and RACV highlights challenges. According to the findings, the current transport system is not meeting the needs of older people who no longer drive, with many older people finding it difficult to undertake the most essential trips like buying groceries or getting to medical appointments.<sup>215,216</sup>

Some of the barriers faced by older Australians include lack of access to public or community transport, being unable to walk to the bus stop or train station, inability to access buses or trains due to physical barriers, and fear of safety and falls.

An NRMA survey of older people highlighted that 56 per cent rated the quality of footpaths in their local area as inadequate:

*“If something as basic as a footpath is not up to scratch for our current population, now is time to*

*start planning and addressing the infrastructure needs for our future ageing population.”<sup>217</sup>*

Encouraging and supporting older people to stay physically active is vital, as there is strong evidence that being active can significantly reduce the risk of heart disease, stroke, and diabetes, and it is an important strategy to strengthen bones and reduce the risk of falls. Regular physical activity may also help prevent the onset of chronic illness, and may delay many of the functional losses that may lead to dependency.<sup>218</sup>

The promotion of regular exercise in older people has been identified as a cost-effective public health measure (Munro et al 1997). A recent study highlighted that shops and services in walking distance, well maintained footpaths, adequate street lighting, streets with little traffic, places to meet, other people walking and safe crossings are factors which are important for older people.<sup>219</sup>

As walking is a popular physical activity for older people, maintaining and improving footpaths and pedestrian crossings to improve safety and convenience for older people with less mobility will become even more imperative, not only to encourage active living, but also as a risk management priority for local councils.

A key focus of the Australian Government’s recent *Living Longer Living Better* aged care reform package is to support older Australians to remain living in their home. To support this policy and to encourage active living, it is necessary to ensure the role of all forms of transport including community transport, local demand responsive services, trains, taxis and buses is considered and supported.

#### 6.4.2 Transport Needs of Children

Many of Australia’s cities and neighbourhoods have changed significantly over the past three decades through urbanisation, which has created many barriers to children’s independent mobility. Streets where children once cycled and played games have become too dangerous because of increased traffic.

213 Rosier, K and McDonald, M, 2011, *The relationship between transport and disadvantage in Australia*, Communities and Families Clearinghouse Australia, Australian Institute of Family Studies, Melbourne.

214 Australian Bureau of Statistics, 2009, *Australian Social Trends 2009*, Australian Government Canberra.

215 NRMA, 2010, *Transport and Mobility Needs of Ageing Australians: Discussion Paper*, NRMA, Sydney.

216 Royal Automobile Club of Victoria, 2006, *Transport and Mobility: Challenges, Innovations and Improvements*, RACV, Melbourne.

217 NRMA, 2010, *Transport and Mobility Needs of Ageing Australians: Discussion Paper*, NRMA, Sydney.

218 Carlson, J et al, 1999, “Disability in Older Adults 2: Physical Activity as Prevention”, *Behavioural Medicine*, 24, 157-168.

219 Van Cauwenberg J, et al, 2011, “Relationship Between the Physical Environment and Physical Activity in Older Adults: a Systematic Review”, *Health Place*, 2011; 17(2):458–69.

According to Australia Walks, since the early 1970s the number of children walking to school has more than halved.<sup>220</sup> This dramatic decline in walking is extremely significant, as physical inactivity and obesity are rising at an alarming rate; one in four Australian children are now overweight or obese.

Only one in ten children ride to school, even though 80 per cent of parents think it would improve their children's health. While 80 per cent nominated too much traffic and lack of safe routes as key barriers to children being allowed to ride to schools, parents surveyed agreed cycling is a good way to get fit. Almost 60 per cent of surveyed parents drove their children to school.<sup>221</sup>

It is recommended children and young people should participate in at least 60 minutes and up to several hours of moderate to vigorous physical activity every day. Unfortunately, many children do not meet those requirements. A study in Queensland showed that up to 30 per cent of children have low fitness levels, while 60 per cent have poor motor skills.<sup>222</sup>

Driving children to school not only has negative health impacts on children, but also puts considerable pressure on the road network during peak hour, particularly in the mornings. Since many of those trips are relatively short, particularly to primary school, there is significant potential to increase the number of trips made by active travel as an effective strategy to manage network capacity and encourage active living.

### 6.4.3 Transport Needs of Young People

Transport is an essential part of life for young people, both the very young (e.g. unaccompanied children walking to school) and adolescents (e.g. pre-teens getting to extra-curricular activities). It enables them to access education, training, employment and social and recreational opportunities.

Research highlights that many young people face significant transport barriers, which are even more severe in regional and rural areas. 1.2 million young people live in rural and regional areas. 96% of young people surveyed said that local transport was a problem, and many indicated lack of transport significantly limits their

educational, employment and social opportunities.<sup>223</sup>

This problem is not limited to rural and regional areas. Research undertaken by VCOSS in Victoria has identified that the lack of, or irregular public transport services; poor connections between buses and trains; safety fears, particularly at unstaffed stations; poor amenities; and lack of user-friendly cycling and walking paths are also significant transport barriers for young people living in Melbourne.<sup>224</sup>

The proportion of young people not in education or employment in rural and regional areas and Melbourne is significantly higher in than in more urbanised areas in Australia.<sup>225</sup>

For many young people the only way to improve access to employment or training is to get a driving licence and a car as soon as they are eligible, which unfortunately exposes them to high risk of injury or even death. According to the NRMA, drivers under 20 years of age are three times more likely than drivers 21 years and over to be involved in a serious crash, and crash risk is higher amongst young drivers in rural areas.

The transport needs of young people in rural and regional areas and urban fringes of our cities are not always met, creating social and economic inequity which can lead to mental health issues and other social problems.

Providing accessible public transport services in low density areas is challenging and requires better and more integrated transport planning.

**Recommendation: Support active living and ageing principles by funding implementation of the Healthy Spaces and Places initiative.**

**Recommendation: Support programs that encourage active travel to school and other educational facilities.**

220 Victoria Walks, 2010, A Step out of Fashion (media release), Victoria Walks, Melbourne.

221 National Heart Foundation and Cycling Promotion Fund, 2012, *Riding a Bike for Transport: 2011 Survey Findings*.

222 Queensland Parliamentary Library, 2004, *Research Brief 2004/10 Childhood Obesity*, Queensland Government, Brisbane.

223 Currie et al, 2005, *Rural and Regional Young People and Transport*, A report to the National Youth Affairs Research Scheme

224 Victorian Council of Social Services, *Mind the Gap: An Assessment of Transport Needs for Young People in Melbourne's Fringes*, VCOSS, Melbourne.

225 Currie et al, 2005, *Rural and Regional Young People and Transport*, A report to the National Youth Affairs Research Scheme.

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