

### 3. Reduced Car Dependency

“Car ownership is dependent on two things: one is wealth and the other one is car dependence. I have no problem with cars and car ownership...car dependence is the problem. If you have to have a car, whether you can afford it or not, that is the problem. We have families now in the outer suburbs who are spending 40 per cent of their income on travel.”<sup>1</sup>

This chapter is divided into three parts. The first will describe what is meant by ‘car dependency’, including debates on the meaning of car dependence and strategies and programs to reduce car dependence in existence at an international level.

The second part will describe strategies and programs operating in Australia, notably in Western Australia, in relation to the *WA State Sustainability Strategy*, public transport provision, pedestrian and walking strategies, efforts to reduce pollution (such as through the trial of hydrogen fuel cell buses), behaviour change programs (TravelSmart) and the role of planning tools, such as the *Liveable Neighbourhoods Code*.

The third part will focus on Melbourne and describes initiatives designed to reduce car dependency and how they contribute to Melbourne 2030 and the Greenhouse Strategy.

On the development of a ‘car culture’, Australian academic Graeme Davison, in his extensive discussion on the car and its place in Melbourne’s growth, has stated:

“Cars are everywhere. They take us to work, shop and play. They monopolise our streets and roadways and mould the landscape to their insistent demands. They are homes away from home, little oases of privacy, where drivers sit alone with their thoughts amidst the hum of traffic or couples cling in dark side streets. In the battle of the sexes, cars are also powerful weapons. They are love objects and status symbols of danger and sudden death.”<sup>2</sup>

## **International developments**

While predictions vary, it is estimated that in excess of two-thirds of the world's population<sup>3</sup> will be living in urban areas towards the middle of the 21st century.<sup>4</sup> In the early 1950s the world's population stood at 2.6 billion. At the same time, 50 million cars were on the world's roads. By 2000, the world's population had risen to 6 billion, with 500 million vehicles in existence. It is estimated the number of vehicles will reach 1 billion by 2050.<sup>5</sup>

## **Definitions and debates: what is meant by 'car dependency'?**

In their comprehensive account and analysis into automobile dependence in 32 major cities around the world, including 5 cities in Australia, Newman and Kenworthy outline automobile dependence:

“Automobile dependence is when a city or area of a city assumes automobile use as the dominant imperative in its decisions on transportation, infrastructure and land use. Other modes thus become increasingly peripheral, marginal or non-existent until there are no real options for passenger travel other than the automobile.”<sup>6</sup>

Todd Litman, from the Victoria Transport Policy Institute in Canada, takes a micro perspective, believing car dependency to be:

“...high levels of per capita automobile travel (“Automobile” includes cars, vans, light trucks and SUVs), automobile oriented land use and reduced transport alternatives. It tends to have poor pedestrian and cycling conditions, limited transit service, underpricing of automobile travel (such as abundant free parking, unpriced roads and low fuel taxes) and dispersed landuse patterns that require a high level of mobility for a given level of access.”<sup>7</sup>

Researchers Thomas and Fordham have integrated 'reduced car dependency' with a definition of sustainable transport, to develop the following aims:

- reducing people's need to travel, both in the number and length of journeys;
- changing the normal mode of transport, from motorcars to foot and cycle; and
- making motor vehicles more energy efficient and less polluting.<sup>8</sup>

Australian road safety researcher Ray Brindle<sup>9</sup> however, believes the existing descriptions and strategies devised to reduce car dependency need to be

reversed. He considers a 'car dependent' person as one who is more likely to be –

- someone whose lifestyle and/or commitments place mobility demands that only a car can satisfy, according to them,<sup>10</sup> or
- someone who cannot envisage travelling any other way but by car, even if they could.<sup>11</sup>

Brindle provides what he views as an interpretation of the term 'car dependence':

"Dependence' has connotations of 'essential relationship' or 'precondition', an 'inability to do without something'. Is that truly what we have here? Car usage is a possible *indicator* of dependence... Getting shifts in modal choices would seem to be much harder if the population is addicted to car travel, as some suggest, so it seems important to be clear about whether we are discussing lack of choice or a stubborn refusal to make the best choices when offered alternatives."<sup>12</sup>

Rather, he sees it as not the car we are 'dependent' on, but what the car provides and for many people, there is no viable alternative.<sup>13</sup> He believes we miss the point if we try to understand car travel in isolation, suggesting 'car dependency' can only be addressed if we take a wider perspective and view car travel as part of an everyday function undertaken by a person, household or firm.<sup>14</sup> Understanding the role the car plays in people's lives is a pre-requisite for developing strategies that offer viable alternatives to the car.<sup>15</sup>

The author is critical of these existing strategies to reduce car dependence:

"...because they form a series of policy thrusts that can involve a range of departments and professions, these countermeasures might be presented as 'integrated' policies to reduce car dependence. That does not mean that they necessarily form a holistic approach, or that they get to the heart of the matter. This might explain why, despite the apparent urgency of the problems caused by private mobility and despite the many quoted changes in modal choice in various cities, 'no country has yet achieved a lasting and large-scale downturn in the total volume of traffic.'<sup>16</sup>

He argues for a wider approach and references work by researchers Giuliano and Narayan in 2003, who concluded that car dependence arises from a number of factors:

1. transportation, housing, land use and tax policy;
2. per capita incomes;
3. cultural preferences;

4. national geography; and
5. spatial structure of metropolitan areas.<sup>17</sup>

To redirect the focus, Brindle suggests a lack of choice is the cause of the problem:

“Because of the way we have built our communities, most people have no choice but to drive to work, shop, play, or worship. Huge numbers of cars, vast parking facilities and a total lack of pedestrian amenities make walking unpleasant and dangerous. In most places, transit runs infrequently, is difficult to use and is slower than driving. Automobile dependence is sustained and promoted by outmoded funding mechanisms and hidden subsidies that transfer its real costs from those who profit directly – developers and other beneficiaries – to the public at large, often to those who are least powerful.”<sup>18</sup>

Brindle believes that ‘habitual car use’, when there are alternatives available, is similar to the tendency for people to show ‘brand loyalty’ in purchases, so that people simply do not recognise available alternatives as being feasible or acceptable.<sup>19</sup>

He goes on to state:

“...those who choose to use a car when other choices are available and known are making a ‘rational’ (but not necessarily optimal) decision. These may be harder to shift than those who either have no alternative at present or who are unaware of alternatives that are available. Transport provision and travel behaviour change programs [such as TravelSmart] are important shorter-term strategies to make present urban areas work better for all these groups.”<sup>20</sup>

While no clear or consistent definition of car dependency exists, some scholars and practitioners have attempted to address the question of how environmental sustainability is affected by vehicle dependence. Newman and Kenworthy, for instance, believe:

“Automobile dependence is the primary force driving cities to increase their use of land, energy, water (both greenhouse gases and local smog related emissions), traffic noise and stormwater pollution (due to the extent of asphalt in Auto Cities<sup>21</sup>); and their economic problems due to the high costs of sprawl-related infrastructure, direct transportation costs; and indirect transportation costs (roads accidents, pollution, etc.); along with the transportation related loss of the public realm, safety and community. It is not possible to

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solve sustainability in cities without first addressing automobile dependence.”<sup>22</sup>

The three most preferred modes identified in the literature to help reduce car dependence are: walking, cycling and public transport. Promoting these alternatives to the car means:

“...we are again engaged in a process of change. This has profound implications for planning and design thinking at all levels; from how we think about the structure of towns and cities and where we locate new development right through to how we lay out individual street blocks and design the buildings within them.”<sup>23</sup>

Newman and Kenworthy<sup>24</sup> have identified US and Australian cities as the most extensive in their level of car dependence, when measured against their transportation patterns, infrastructure and land use. Canadian cities are placed a level below, being less car dependent, having a better public transport system and greater integration of land use. In contrast, European cities are three to four times less car dependent than US and Australian cities.<sup>25</sup> However, the best performing cities in relation to reduced car use are some of the wealthy Asian cities, namely Singapore, Hong Kong and Tokyo, which are eight times less dependent than US cities.<sup>26</sup>

In economic terms, the authors believe car dependence has an adverse effect on the economy of cities, arguing that cities which provide a range of transport options are more efficient on almost every economic indicator.<sup>27</sup> The analysis by Newman and Kenworthy indicates this even extends to the cost of maintaining the transportation system, with car dependent Australian and US cities using 12-13% of their city’s wealth on passenger transportation systems.<sup>28</sup> In comparison, Canadian and European cities are estimated to spend 7-8%, wealthy Asian cities 5%, while more auto-oriented newly industrialising Asian cities use 15% of their wealth on transportation.<sup>29</sup>

## **Strategies to reduce car dependency**

There are divergent opinions on how best to reduce ‘car dependency’. For instance, Brindle<sup>30</sup> believes there are two options to reduce car use, namely:

- Physical planning is needed to ensure that adequate choices and good quality local accessibility are available – but will not bring about an end to car dependence. Neither will Travel Demand Management; and
- There has to be a breakthrough, involving major changes in the way society operates. There are two paths to reduced (and perhaps elimination of) car dependence:

- A major shift (spontaneous or induced) from present value systems and choice behaviour; or
- A breakthrough to a new technological paradigm that provides new ways to satisfy mobility and access demands of the local and global complexes that we have woven for ourselves.<sup>31</sup>

Newman and Kenworthy, however, propose the following solutions to reduce car dependency, along the lines of those undertaken by Singapore and Hong Kong:

- Commitment to investing in a quality transit system, preferably rail;
- Preparedness to introduce simultaneous structural and economic restraints/disincentives on private transport, that contributes to investment in public transport; and
- Investment in relatively inexpensive improvements in the environment for pedestrians and cyclists.<sup>32</sup>

At the practical level, a number of techniques can be employed in order for cities to reduce their level of car dependence:

- Traffic calming – to slow vehicle traffic and create more urban, humane environments better suited to other transportation modes;
- Quality transit, bicycling and walking – to provide genuine options to the car;
- Urban villages – to create multinodal centres with mixed, dense land use that reduces the need to travel and are linked to quality transport systems;
- Growth management – to prevent urban sprawl and redirect development into urban villages; and
- Improved taxing of transportation – to cover external costs and to use the revenue to help build a sustainable city.<sup>33</sup>

Newman and Kenworthy argue the process of moving away from an 'Auto City' to a 'Sustainable City' can be achieved in stages, which are considered to be:

- revitalising the central and inner cities;
- focusing development on transit oriented locations that already exist and are underutilised;
- discouraging urban sprawl by growth management strategies; and
- extending transit systems, particularly rail systems and building associated urban villages to provide a subcentre for all suburbs.<sup>34</sup>

Thomas and Fordham suggest a number of planning and urban-design principles to assist in reducing car dependence, which can be summarised as:

- Shops and services should be focused along a main street;
- Community facilities such as schools, health centres and open spaces should be distributed around the neighbourhood;
- The neighbourhood should provide a wide range of different housing opportunities;
- Housing densities should be highest around the edges of the town or district centre, along the principal transport routes leading to neighbouring centres, with densities reducing towards the edge of the walking catchment; and
- Movement routes should be shared by cars, buses (or trams), cyclists and pedestrians.<sup>35</sup>

They argue there is a key relationship between density and transport and the best hope for achieving sustainable transport lies not in automotive technological advances, but rather with a radical shift in land-use planning, which in turn reflects changing social patterns, for instance working from home.<sup>36</sup> The transport – density linkage is supported by Newman and Kenworthy, who make the following comment:

“Density reduces transportation energy through several mechanisms: it shortens distances for all modes and makes transit, bicycling and walking more viable as alternatives to the car; it also reduces the number of journeys, since when transit is used, many journeys are combined – for example, shopping on the way to or from the train.”<sup>37</sup>

## Travel demographics and well-being

A recent analysis of the results of the US 2001 National Household Travel Survey (NHTS) identified car use as dominating urban travel among every sector of the population.<sup>38</sup> The authors recommend government housing and transportation policies be coordinated in order to facilitate the accessibility of low income or disadvantaged groups to public transport.<sup>39</sup>

The report also notes the disparity between spending priorities of federal transportation funds in the US. While over US\$75 billion a year is being spent on federally assisted roadway projects, less than US\$1 billion a year is spent on pedestrian and bicycling projects and only 0.7% is spent on improving the pedestrian environment and making it safer to walk.<sup>40</sup>

In state terms, the report notes that no US state spends more than 2.7% of their federal transportation funds on sidewalks, crosswalks, traffic calming, speed humps, multi-use paths or safety programs for cyclists and pedestrians, despite walking accounting for 16.2% of trips made by the poor.<sup>41</sup>

Thomas and Fordham, in the table below, describe various measures of health and well-being, based on transport mode in London.

Table 3.3.1: Nature and scale of some impacts of transport on health in London

<b>Impact</b>	<b>Scale (Total)</b>
Road accidents, fatalities (2000)	<b>286</b>
Road accidents, total casualties (2000)	<b>46,003</b>
Percentage considering noise from road traffic a nuisance (GB figure, 1991)	<b>63</b>
Calories consumed for 70g person (kcal/h), driving a car	<b>80</b>
Calories consumed for 70kg person (kcal/h), walking at 5km/h	<b>260</b>
Calories consumed for 70kg person (kcal/h), walking at 7km/h (brisk walk)	<b>420</b>
Estimated net life extension, compared to whole population, of those who walk or cycle to work	<b>2 years</b>

Source: Thomas, R. & Fordham, M. (eds) (2003) *Sustainable Urban Design: An Environmental Approach*, Spon Press, London, p.25.

In Victoria, VicHealth, as part of its initiative to promote physical activity, provided a similar finding, including identifying:

- 51% of females and 34% of males in Victoria do not participate in enough physical activity to achieve health benefits;
- People who are inactive are almost twice as likely to die from coronary heart disease than people who are physically active;
- Sedentary lifestyle is responsible for approximately 8% of premature deaths in Victoria;
- It is estimated that 122 deaths per year in Australia from coronary heart disease, non-insulin dependent diabetes and colon cancer could be avoided for every 1% increase in the proportion of Australians who undertake regular physical activity; and
- Annual direct health care costs linked to physical inactivity in Australia is around \$377M per year.<sup>42</sup>

### **Urban design as a method to reducing car dependency**

On an international level, US planner Michael Southworth, in a case study comparison between conventional suburbs with neotraditional developments noted:

“One of the few alternatives to the suburban sprawl approach to development in recent years has been the neotraditional community, characterised by somewhat higher densities, a greater mix of uses, provision of public transit, accommodation of the pedestrian and the bicyclist and an interconnected pattern of streets.”<sup>43</sup>

Southworth states, in relation to whether walkable suburbs are possible:



“Whether new urban development based on traditional patterns can be made to work in today’s marketplace remains to be demonstrated. The creation of walkable enclaves within regional sprawl, however delightful, may not reduce automobile dependence or solve regional transportation and environmental problems.”<sup>44</sup>

Southworth believes local efforts at creating convenient, less auto-dependent neighbourhoods and communities will be most successful within a regional framework that provides the transit infrastructure and encourages a denser pattern of development with mixed uses.<sup>45</sup>

This sentiment is reflected in the work of Thomas and Fordham, who noted:

- the key to sustainable transport lies not so much in new technology as in changed urban design priorities such as:
  - higher-density development, located around public-transport stops and interchanges;
  - mixing of uses (houses, shops, workplaces, schools and public facilities) within the same area; and
  - better public transport.
- Good design has a vital role to play in reversing the perception that public transport is only for the second-class citizen.
- Sustainable transport cannot be achieved instantly. But “early wins”, such as street improvements and better public transport, can show its potential to improve everyone’s quality of life.<sup>46</sup>

In relation to street design, residential areas can be improved by redesigning traditional streets as “urban court-yards”, reducing road traffic. This can be achieved through:

- Closing the road to through traffic;
- Giving right of way to pedestrians and introducing “dead slow” (10km/h) speed limits;
- Making the streets safe for children to play; and
- Limiting parking.<sup>47</sup>

The English Partnerships publication ‘The Urban Design Compendium’ describes what they have termed a ‘Movement Framework’, focusing on the street and footpath networks. They believe a successful movement framework:

- Provides the maximum choice for how people will make their journeys;
- Takes full account of the kinds of movement a development will generate; and
- Makes clear connections to existing routes and facilities.<sup>48</sup>

The aim of the movement framework is to, wherever possible or practicable, make it as easy and attractive to walk, cycle or use public transport, as it is to travel by car.<sup>49</sup>

### Priorities, incentives and restrictions

Canadian transport researcher Todd Litman has stated: “current transportation markets are distorted in ways that result in excessive automobile travel.”<sup>50</sup> He provides an example of this distortion with the free parking arrangements offered to many employees, although no benefits are offered to those who use alternative modes. Litman notes giving employees who don’t drive the cash equivalent of their parking subsidy tends to reduce automobile commutes by 10-15%.<sup>51</sup> Similarly, fixed vehicle insurance pricing is less equitable and less efficient than distance based pricing and encourages additional driving.<sup>52</sup> Litman argues a third or more of current vehicle use could be reduced by eliminating market distortions that encourage inefficient travel.<sup>53</sup>

Litman<sup>54</sup> outlines ‘Smart Growth’ and ‘Transportation Demand Management’ (TDM) strategies, in an article titled ‘Reinventing Transport’ which, he argues, can increase social welfare and equity<sup>55</sup> and help achieve reduced car dependency through urban design.

TDM which is one of the ‘Smart Growth’ Strategies, refers to various strategies intended to encourage more efficient and diverse transportation.

Table 3.3.2: TDM Strategies

Strategy	Description
Pricing reforms	Comprehensive tax and price reforms.
Least-Cost Planning	Transportation planning that allows demand management to be considered equally with capacity expansion projects.
Park & Ride	Parking at urban-fringe transit stops.
HOV Preference	Transit and rideshare priority measures.
Transit improvements	Improved public transit service.
Ridesharing	Rideshare promotion and matching.
Bicycle Encouragement	Support and encouragement for cycling.
Nonmotorized Improvements	Improved bicycle and pedestrian planning, facilities and services.
Intermodal Bike	Bike lockers at stops, bikeracks on transit vehicles.
Tele-access	Telecommunications that substitute for physical travel, including telecommuting, teleshopping, distance learning, etc.
Alternative Work Hours	Flex time and alternative work weeks (such as four 10-hour days)

Guaranteed Ride Home	Provide a limited number of free rides home for commuters who do not drive.
Address Security	Address security concerns of non-drivers.
Full Cost Pricing	Pricing reforms to charge users directly for the costs they impose.
Increased Fuel Taxes	Increase federal and state fuel taxes.
Road Pricing	Road tolls and congestion pricing.
Vehicle Restrictions	Restrict vehicle use in specific areas or at certain times.
Parking Pricing	Charge users directly for parking. Avoid discounts for long-term leases.
Commuter Financial Incentives	Financial benefits to commuters who use alternative modes. Includes Parking Cash Out, transit and ridesharing benefits.
Parking Management	Encourage shared parking and other parking management strategies.
Distance-based fees.	Mileage-based vehicle insurance and registration fees.
Carsharing	Convenient, short-term vehicle rentals that substitutes for vehicle ownership.
Neotraditional Planning	Develop neighbourhoods that encourage walking, bicycling and transit use.
Traffic Calming	Street design features to reduce vehicle traffic speeds when appropriate.
Smart Growth	Land use policies that encourage more efficient land use.
Reduce Parking and Road Standards	Reduce excessive and inflexible parking and road capacity requirements. Manage parking for efficiency.
Transport Management Associations (TMAs)	An organization of businesses that provides transportation management and parking management services in a particular area.
Regulatory Reforms	Reform motor-carrier regulations to encourage competition and innovation.
Location-Efficient Development	Encourage higher density, affordable housing near commercial centres, transit lines and parks.

Source: Litman, T. (2000) 'An Economic Evaluation of Smart Growth and TDM: Social Welfare & Equity Impacts of Efforts to Reduce Sprawl and Automobile Dependency' *Victoria Transport Policy Institute*, p.7. Online publication Available at: [http://www.vtpi.org/s\\_growth.pdf](http://www.vtpi.org/s_growth.pdf)

Litman argues Canadian land consumption and vehicle travel are currently underpriced, which encourages 'sprawl' and automobile dependency. He highlights the benefits of shifting from driving to public transport, which can

reduce traffic congestion, parking costs, crash risk (and therefore insurance costs) and environmental impacts. He notes, however, these savings are not returned directly to the person who shifts from driving to public transport use. As a result (in cases where public transport is available): "...consumers lack the incentive to use the most economically efficient housing or transportation option and they lack the opportunity to save money by choosing more efficient alternatives."<sup>56</sup>

He notes:

"Charging motorists directly for their road and parking costs, congestion impacts, crash damages and pollution is predicted to reduce automobile use by 1/3 or more. International comparisons also indicate that automobile travel declines significantly in regions with more efficient pricing, even if residents have high incomes."<sup>57</sup>

## **Public transport**

Strategies and programs to reduce car dependency by creating environments designed for pedestrians, cyclists and public transport is recognized as a key aspect of sustainable development.<sup>58</sup>

Researcher Rodney Tolley has argued that walking is involved in all public transport journeys, while it is the main modes of access for over 60% of all journeys where the main mode of transport is public transport.<sup>59</sup> Tolley has also noted evidence from the UK (London Transport), suggesting there is a direct link between the level of bus patronage and the quality of pedestrian access to the bus stop.<sup>60</sup>

In relation to public transport usage, the NHTS reported that public transit's share of urban trips continued to decline between 1995 and 2001, from 2.2% to 1.7%.<sup>61</sup>

The results also indicated that, in particular, the poor, minorities and elderly, depend on the car rather than public transport to move around, reflecting: "even those who cannot really afford cars or who have physical or mental disabilities are forced to rely on the car."<sup>62</sup>

In an article titled: 'The future of public transport: the dangers of viewing policy through rose-tinted spectacles,'<sup>63</sup> Transport researcher Mayer Hillman argued that while improved public transport services are generally viewed as the most effective means of encouraging transfer from the car, especially on urban journeys and substantial funds are therefore being invested, such an approach achieves little. The author compared patterns of travel in Britain and the Netherlands, to demonstrate that the prioritising of walking and cycling is not only far more effective and cost-effective in achieving the transfer, but is also likely to deliver a wide range of social, health and

environmental benefits. He recommends investment in networks for walking and cycling and in other measures enabling journeys to be made by these non-motorised modes, prior to investing in public transport.<sup>64</sup> Hillman argues:

“A consensus is being reached that, in the light of all its adverse consequences, demand for car travel must be reduced. Restrictions will have to be progressively but speedily phased in during the next two decades – for instance, through private and public parking control, much lower and properly enforced speed limits, traffic calming, much heavier taxation of fuel and possibly fuel rationing.”<sup>65</sup>

In response, he recommends:

“...to meet the objective of providing a realistic substitute for the car, an investment strategy would be better directed to provision first, for safe and convenient pedestrian networks for short journeys; second, for safe and attractive cycle networks for other urban journeys; and third, for the non-motorised modes in combination with public transport for longer journeys.”<sup>66</sup>

Urban design researcher Gauzin-Müller has identified a variety of interconnected factors which can increase public transport use:

- Better ring roads to keep traffic out of city centres;
- A closely-spaced urban network;
- Well-designed timetables and tariff structures; and
- An improved service, with updated vehicles and better safety and security.<sup>67</sup>

Thomas and Fordham argue, in relation to the provision of viable public transport:

“Density is a tool to ensure that viability: the higher the density, the better the level of service that can be provided. Public-transport services that provide a genuine alternative to the private car will only work where there are sufficient people: hence the need for clusters of higher density within walking distance of public-transport stops and interchanges.”<sup>68</sup>

They recommend greater priority be given to the design of public transport systems, although they recognise the:

“...challenge of establishing status and image: the design of stops, stations and interchanges must counteract the

prevailing impression that public transport is only for those who cannot afford a car by being made to look smart and safe. Their location, their relationship to the urban grid and their architecture must all be used to emphasise the status of public transport, its central role at the heart of the place and its ownership by the community.”<sup>69</sup>

This challenge is reinforced when considering:

“Nothing contributes more to the sense of second-class citizenship of public-transport users than the long wait at a cold bus stop. It also gives a sense of powerlessness, in contrast to car users, who can move as and when they wish. The technology to provide real-time [travel] information, not just at stops, but to homes, shops and mobile phones, already exists.”<sup>70</sup>

### ***Integrated public transport***

In a recent article, road safety researchers Luk & Olszewski describe the measures recently taken to improve the integration of transport services in Singapore and Hong Kong.<sup>71</sup>

Road safety researchers Janic and Reggiani define ‘integrated public transport’ (also referred to as ‘integrated transport’) as a system that provides door-to-door public transport services for passengers.<sup>72</sup> The authors outline a number of categories as measures for integrating transport services, including:

- a) Physical integration – the close proximity and ease of access at mode interchanges will greatly enhance public transport services. Walkways should be carefully designed for passengers to change mode. Passengers should be within a short walking distance from their residences to a transit stop.
- b) Network integration – bus and rail systems should be an integrated network in their own right and these separate networks should further complement one another. Feeder services using buses, trams or light rail should be designed to maximise the patronage of the trunk routes. Network integration is closely linked to physical integration and both contribute towards the integration of infrastructure.
- c) Fare integration – a single fare card for multiple transit services will facilitate the transfer between modes. Rebates can be implemented as an inducement for those who transfer from one mode to another.
- d) Information integration – a comprehensive, easy-to-use passenger travel guide is critical to successful multi-modal travel. The signage at

rail and bus stations should be properly designed to convey effective information to travellers. Information technologies (IT) and Intelligent Transport Systems (ITS) can play important roles in integrated transport in general and information integration in particular.

- e) Institutional integration – a common institutional framework is better able to undertake land-use planning, travel demand management and integrated public transport services. In the absence of such common framework, co-operation and co-ordination amongst government agencies and between the private and public sectors, become vitally important.<sup>73</sup>

Luk and Olszewski provide transport comparisons between Melbourne, Hong Kong and Singapore, as detailed in the table below:

Table 3.3.3: Urban Transport features of Melbourne, Singapore and Hong Kong

Characteristic	Melbourne	Singapore	Hong Kong
Population (million)	3.5	4.16	6.79
Area (km <sup>2</sup> )	2025	685	1100
Population density (per km <sup>2</sup> )	1720	6075	6300
Private car ownership (/1000)	490	113	50
Public transport modal share %of total motorised trips	9.5%	63%	90%
Public transport modal share % of total passenger km	8%	47%	82%

Source: Luk, J. & Olszewski, P. (December 2003) 'Intregrated public transport in Singapore and Hong Kong', *Road & Transport Research*, 12(4), p.42.

Reference is also made to people 65 years and over, who generally tend to make fewer and shorter trips, although the new generations now entering the retirement age are seen to have higher aspirations of leading an active lifestyle.<sup>74</sup> Planning needs to take account of this changing demographic.

Gauzin-Müller makes reference to various Scandinavian towns that have free bicycle loan schemes, aimed at encouraging cycle use by both residents and visitors. For instance, Copenhagen has a coin-release system, the same as supermarket trolleys, where the coin is returned when the bicycle is put back; while the bikes' distinctive appearance (bright yellow with solid wheels and use of non-standard parts) mitigates against their disappearance.<sup>75</sup> A similar scheme, using electronic cards, was introduced in Rennes in 1998.

### **'Park and Ride'**

As a method to reduce the car dependency for people living in the outer suburbs who wish to travel into the city, a number of 'Park and Ride' schemes operate both overseas and in Australia and provide for people to

travel into designated areas near or in the city by car, park for free in secure car parks and complete their journey into the city centre by public transport.

For instance, In Scotland, the Ferrytoll Park & Ride is a bus park & ride scheme which operates from the South of Fife to Edinburgh. It is a joint initiative, developed between Fife Council and the bus operator, Stagecoach. This particular 'Park and Ride' scheme involves the following features:

- Buses to Edinburgh City Centre every 10 minutes (daytime);
- Buses to locations/suburbs outside the Edinburgh CBD;
- CCTV secure free car park for up to 500 vehicles, including spaces for disabled drivers and 'parents & toddlers'; and
- A staffed facilities building which includes a waiting area with vending machines, toilets, ticket machine, cardphone and TV.

Construction started in November 1999 and the site opened in November 2000 at a cost of £4.2m. The scheme's construction was funded by The Scottish Executive, Fife Council, The European Union and Fife Enterprise.<sup>76</sup>

Similarly, in Los Angeles, a Park and Ride facility provides up-to-date information on the location, number and availability of spaces, days and hours of operation, transit services serving the facility and amenities available at the site.

Park and ride facilities are used primarily by people who wish to carpool or those using public transport and in most cases are free. In LA, most park and ride facilities in the region are open 24 hours a day, seven days a week, while some facilities are leased from churches, shopping centres and other privately-owned groups.<sup>77</sup>

A number of schemes, known as 'Park and Ride' and 'Kiss and Ride', operate in Australian cities. In Victoria, for instance, a major purpose built 'Park & Ride' facility opened in January 2003 in the eastern Melbourne suburb of Doncaster. With provision for 400 vehicles at a time, a 'Kiss & Ride' drop off point was also constructed. The facility is serviced by a bus service to the city, operating every 5 minutes during the morning and evening peak periods, while a 15 minute off-peak and 30-minute night service also operates from the facility.<sup>78</sup>

**Recommendation 17:**

**The Committee recommends the Victorian Government undertake an evaluation of the effectiveness of car use reduction strategies operating overseas and identify the program(s) that are best suited to Melbourne's Interface council areas.**



## **Best Practice in Australia**

This section describes strategies and programs operating in Australia, notably in Western Australia, where significant progress is being made in the area of sustainability and sustainable urban design generally and, of specific relevance to this chapter, strategies to reduce car dependency.

The following section will provide information on the Western Australian Government's State Sustainability Strategy, public transport provision, pedestrian and walking strategies, efforts to reduce pollution (such as through the trial of hydrogen fuel cell buses), the role of TravelSmart in promoting behaviour change and the effectiveness of planning tools, such as the WA Liveable Neighbourhoods Code, in helping to reduce car dependency at a national level.

### ***Levels of motor vehicle use and travel patterns***

Statistics from the 2001 Census indicate that in relation to motor vehicle use levels in Australia, 10% (708,073) of Australian households did not have a car, 38% (2,692 million) had one car, 33% (2,328 million) had two cars and 12.5% (886,509) had three or more vehicles, while 6.5% (457,222) did not state an option.<sup>79</sup>

In relation to modes of travel to work, with total labour force participation at 60.3%, Australia-wide, 58% (4,816 million) people drove to work, 6.2% (513,233) were car passengers, 3.2% (265,102) travelled by train, 2.5% (208,294) by bus, 0.4 (32,529) by tram, 3.8% (316,636) walked and 0.9% (78,210) cycled to work.<sup>80</sup>

In September 2003, the ABS published the results of a survey of motor vehicle use for the 12 months ending 31 October 2002. The results noted that, there were an estimated 12.8 million vehicles registered in Australia, which is an 8.3% (1 million) increase since the twelve months ending 31 July 1998. While NSW had the largest share of vehicles registered (30%), this was followed closely by Victoria at 26.8%. Results also indicate that the majority of vehicles registered were passenger vehicles (79.3%).<sup>81</sup>

The statistics also state that between the 1998 and 2002 survey periods, the total distance travelled by passenger vehicles has increased by an average of 3.2% per year.<sup>82</sup>

In relation to fuel consumption, 26,164 million litres of fuel were consumed by motor vehicles in Australia for the 12 months ending 31 October 2002, an increase of 12.5% (2,906 million litres) since the 12 months ending 31 July 1998. Over the same five year period, the ABS reported the estimated number of vehicles in Australia increased by 8.3% and the kilometres travelled increased by 14.5%.<sup>83</sup> As at 31 October 2002, 3,442,573 vehicles were registered in Victoria, up from 3,235,515 in 2001.<sup>84</sup>

## Developments in Western Australia

The *WA State Sustainability Strategy*, which has been discussed in other parts of this Report, includes a section on integrating land use with transport and argues “car dependence arises when cities are built with ‘scattered’ suburbs, forcing people to rely heavily on cars to reach services, jobs, schools and shops.”<sup>85</sup>

In line with all sections of the *WA State Sustainability Strategy*, a number of actions are proposed. In regard to transport and land use planning, some of the actions, which could be relevant to Victoria, include:

- Provide equitable taxation treatments and salary packaging arrangements that do not allow public transport and bicycles as travel options.
- Encourage pedestrians and bicycle use through:
  - Developing friendly environments in town centres;
  - Improving pedestrian and cycle access on local streets;
- Continuing the implementation of the TravelSmart Household program and complimentary TravelSmart initiatives;
- Providing guidelines which assist local government authorities to audit and improve the accessibility of their pedestrian and cyclist infrastructure;
- Updating the Perth Bicycle Network Plan;
- Promote further integration of buses and other travel modes, such as cycling, to the existing train system and actively prioritise improvements to new station precincts where better integration is possible, thereby ensuring residents have the opportunity to complete their entire journey using public transport;
- Research and document vehicle trip behaviour and personal travel mode choices to establish planning implications for land development, traffic management, bus priority measures and cycling infrastructure projects;
- Provide safe and economical bike parking at train and bus stations and car parking at designated Park and Ride Stations; and
- Develop programs that increase mixed-use development in strategic and other regional centres with good public transport provision and where possible, identify public transport requirements and funding support as part of development applications.<sup>86</sup>

## Environmental issues and developments

On 15 June 2004, the Prime Minister released the Government’s energy white paper, titled *Securing Australia’s Energy Future*.<sup>87</sup> The *White Paper* included the following key features:

- Overhaul of fuel excise system, resulting in a projected \$1.5bn reduction in the costs to business, consumers, state and local government by 2012-13;
- \$75m for 'Solar Cities' trials;
- \$500m fund for investment in new technologies for greenhouse gas reduction;
- \$134m to make renewable technologies cost efficient high energy users required to undertake regular energy efficiency assessments; and
- large energy projects required to manage emissions through membership of Greenhouse Challenge Program.<sup>88</sup>

In its submission to the House of Representatives Standing Committee on Environment and Heritage, Inquiry into Sustainable Cities, the Australian Conservation Foundation (ACF) stated its vision of a 5 Star Green City, which:

- Produces zero net greenhouse pollution;
- Recycles and reuses water;
- Creates zero waste;
- Has an integrated transport system; and
- Protects its natural and cultural heritage.<sup>89</sup>

ACF believe the Commonwealth Government should develop a 5 Star Green Cities Program and, in relation to reduced car dependency, recommends the Federal Government:

- Either remove Fringe Benefit Tax advantages for company car use and parking or provide equivalent advantages for public transport fares and bicycles;
- Should establish a program through which seed funds for service improvement are made available to public transport service providers. The objective of the program would be to improve patronage on urban public transport systems through improvements to speed, frequency and connectivity of established public transport networks;
- Increase funding for a reinvigorated National Bicycle Strategy, as an important environmental and public health measure;
- Reassess the allocation of Federal Government transport funds to the States, to achieve a more even balance between road and other transport funding;
- Improve public transport patronage through a Federal fund for service improvements;
- Should either remove Fringe Benefit Tax advantages for company car use and parking or provide equivalent advantages for public transport fares and bicycles;
- Should increase funding for the National Bicycle Strategy, as an important environmental and public health measure; and

- Provide funds for sustainable transport community education projects to support the uptake of sustainable transport options across the community.<sup>90</sup>

### ***Hydrogen Fuel Cell technology***

The Western Australian State Sustainability Strategy, in relation to a section titled 'Oil vulnerability, the gas transition and the hydrogen economy', makes the comment:

“...the world is using oil at a much faster rate than it is being found – four barrels are used for every one found (some estimates suggest this could be as high as nine). Added to this are the problems of greenhouse emissions from oil use and the car dependence in cities.”<sup>91</sup>

The Strategy highlights Australia's high level of oil 'vulnerability', with Australia facing a \$7.6 billion deficit by 2010, from a surplus of \$1.2 billion in 2001 and calls on the Commonwealth Government to “facilitate the transition to lower emissions fuels and vehicle technology without picking winners.”<sup>92</sup> The Strategy also makes note of demonstration projects currently underway involving CNG, LPG, biodiesel and hydrogen fuel cells, which need to be carefully monitored.<sup>93</sup>

A high level of interest has been generated in hydrogen fuel cell technology, especially over the past year, with conferences being held during 2004 in New South Wales, Western Australia and Tasmania.

On 27 August 2004, engineers from the University of NSW announced research findings into technology which uses solar energy to create hydrogen fuel, without producing greenhouse emissions.<sup>94</sup> At an international level in 2003, the US Government announced an A\$1.7B initiative to develop commercially viable hydrogen fuel cells for the transport sector.<sup>95</sup>

**Recommendation 18:**  
**The Committee recommends the Federal Government take a leadership role in hydrogen fuel cell technology and for the Victorian Government to closely monitor developments in this area.**

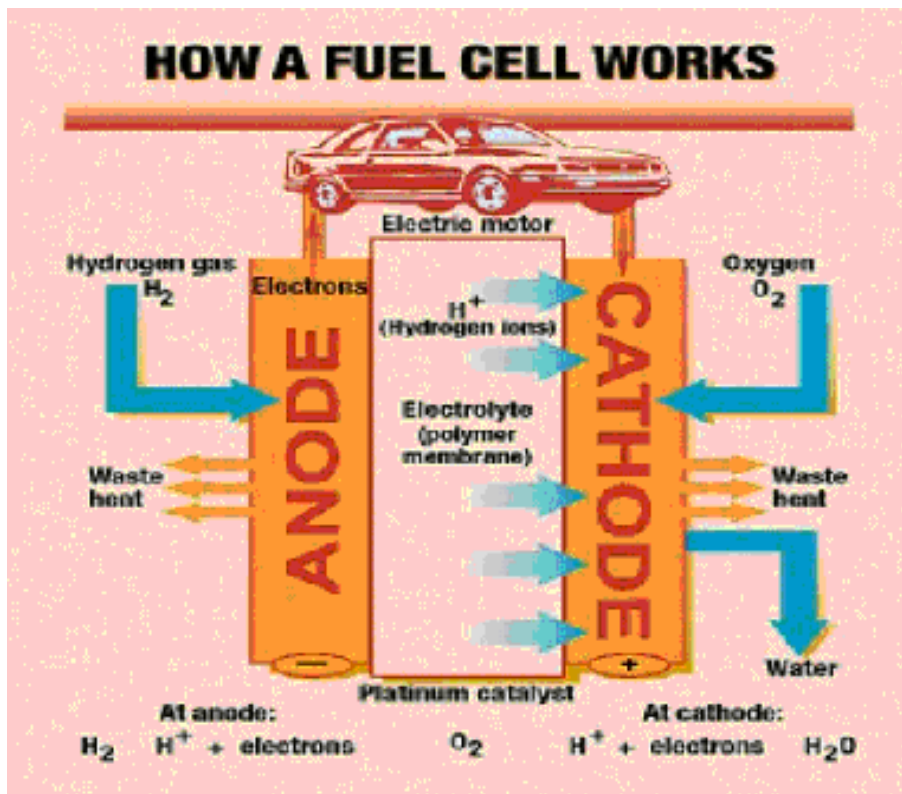
The Strategy highlights transport energy demand can be minimised through urban design that provides for quality public transport and non-motorised options, such as bicycle and walking options. The Strategy's vision in this area foresees a development whereby:

“Oil-based transport moves quickly to a combination of gas based systems and there is an increase in the provision of public transport, cycling and walking, infrastructure as a means to forestall oil vulnerability. Then hydrogen becomes the basis of the provision of power for our economy, using fuel cells and hydrogen gas produced from renewable energy.”<sup>96</sup>

The WA Government now requires all Transperth buses procured after June 2002 to be powered by natural gas. In addition, other fuel sources are also being assessed, with Perth being the only southern hemisphere city participating in a world trial of the latest fuel cell bus technology, with three cell buses to be included in the Transperth fleet by mid 2004.<sup>97</sup>

The hydrogen fuel cell is an electrochemical energy conversion device. Researcher Lisa Garrity, in an article on the WA hydrogen fuel cell buses, has described the process of how a hydrogen fuel cell works: hydrogen and oxygen are fed into opposite sides of a cell, which are separated by a membrane permeable to hydrogen ions but not electrons. Hydrogen gas molecules entering the anode side of the cell are ionized in the presence of a catalyst to form protons and electrons. The protons pass through the membrane to combine with the oxygen and electrons to produce water at the cathode. The electrons flow through an external circuit from the anode to the cathode, creating an electrical current, which powers an electric load such as a motor. The process is outlined in the diagram below:

Figure 3.3.1: How a Fuel Cell Works



Source: <http://www.sustainability.dpc.wa.gov.au><sup>98</sup>

In relation to the technology, Garrity noted:

“A global consensus is emerging that hydrogen fuel technology will replace the internal combustion engine and fossil fuels in the near to mid-term future. It has also been predicted that the hydrogen fuel cell bus will be cost-competitive with diesel and natural gas buses by 2006-8.”<sup>99</sup>

It was also argued that hydrogen fuel technology demonstrates the following sustainability characteristics:

- Hydrogen is the most abundant element in the universe, capable of providing a virtually unlimited source of power supply;
- The production of hydrogen by electrolysis using renewable energies will emit no greenhouse gases;
- The use of fossil fuels in the production of hydrogen to power fuel cell vehicles will produce a net lifecycle reduction in greenhouse gas emissions when compared to existing vehicle and fuel technology.
- Hydrogen fuel cell vehicles produce no smog;
- The introduction of Hydrogen fuel cell vehicles will help countries to reach greenhouse gas reduction targets set out in the Kyoto protocol.
- Hydrogen may be produced locally based on the resources available in a specific region;
- The trial will help to promote the use of alternative fuels amongst the community; and
- The project demonstrates an ideal partnership between government, industry, academic and environmental organizations around the world in the quest to find a clean and efficient energy source for transportation.<sup>100</sup>

Even this technology has its critics, however. Fisher<sup>101</sup> in an article on ‘responsible urban commuters’, has rhetorically asked:

“Are there then any ‘clean’ or ‘pollution-free’ fuels? Well, I’m sorry, but there aren’t. All fuels, including hydrogen for the vaunted fuel cells, generate much more heat (over their life cycles) than motion. That heat makes our cities ‘urban heat islands’ sitting in cooler rural environments. All fuels generate greenhouse gases of which water vapour is as serious as carbon dioxide; all generate a range of toxic pollutants coming in part from the fuels’ own production, packaging, handling and transport processes.”<sup>102</sup>

## **Public Transport in Western Australia**

In 1998 the WA Government released its document, titled: *Better Public Transport: Ten-Year Plan for Transperth 1998-2007*, the then Minister for

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Transport, Eric Charlton MLC, specified four main public transport planning strategies designed to enhance the public transport system. These involved:

- Attractive and easy access hardware (small and large buses, trains and ferries and facilities at stops and stations, including shelters, Park 'n' Ride and bicycle storage);
- User-oriented services, such as accessible and easy to understand information, 'memory' timetables and attractive bus, train and ferry services with improved frequency, area, coverage, directness, reliability and safety;
- Metropolitan transport policies which give priority to trains, buses, commercial vehicles and cars with more than one occupant; and
- Intensive land use developments on major public transport 'spines' and activity centres and subdivisions designed for easy access by public transport.<sup>103</sup>

Photo 3.3.1: Major public transport 'spine', WA

Centered

In their presentation to the Committee, Mr Mark Burgess and Mr Gary Merritt from the WA Public Transport Authority (Transperth) provided the Committee with information on public transport developments, especially in terms of fleet and station upgrades, the use of new fuel technologies and increases in patronage levels.

They emphasised this, especially in rail travel, which has seen patronage increase from 9.5 million passenger boardings per year in 1992 to 30 million seven years later, as a result of the introduction of the Perth electric rail system.<sup>104</sup>

Transperth currently has 99 gas buses.<sup>105</sup> In addition, Transperth has also just received three hydrogen powered fuel buses (mid 2004), for a two-year service trial.<sup>106</sup> The stated purpose of the trial is to determine the critical technical, environmental, economic and social factors that are needed in order to introduce hydrogen fuel cell buses.<sup>107</sup>

Mr Burgess told the Committee:

“If you want public transport to compete with cars, the routes must be as direct as possible and there must be a fair degree of resistance to convoluting the bus routes and taking them [passengers] through the back blocks.”<sup>108</sup>

In response to a question from Committee Member, Mr Adem Somyurek, following a visit to the inner Perth suburb of Subiaco earlier in the day, who asked whether the railway station at Subiaco had decreased car usage and/or increased public transport usage, Mr Burgess replied:

“It has certainly substantially increased public transport patronage from that station. I am not sure we can necessarily say that is entirely because the station is better. The reality is a lot more people live around the station now than they did before, so I think it was inevitably going to increase patronage. The reality is that it has done a very good job of increasing the throughput of that station. There is a program here picking up on the Subiaco model called TOD or Transit Oriented Development. In that Dialogue with the City program that I spoke of, where the minister engaged the community, Transit Oriented Development was a theme that the 1,000-odd community members certainly picked up on. They were very much driving the idea that all transport hubs, bus or train, should have a much higher residential density around them and there should be a commercial-residential mix in that precinct.”<sup>109</sup>

The issue was also raised about a definition of ‘viable passenger catchments’, in response to a question from the Chair, Mr Don Nardella MP.

Mr Merritt told the Committee:

“What we like to think of is that there are 300 dwellings per bus route kilometre, so for every kilometre that the bus runs, you have 300 dwellings within the walkable catchment, which is basically within 500 metres of the bus route. You achieve that with R20 or above.”<sup>110</sup>



Mr Merritt went on to explain the contractual relationship between the State Government and the transport operators, as being an integrated system in which

“...government sets the fares, government owns the buses, we [government] own the infrastructure, even down to the depots. Some of our operators own their own depots, but basically government owns all the infrastructure. Really, what our operators are doing is providing the labour to drive and run the service. We see it very much that they deliver our service.”<sup>111</sup>

## **TravelSmart**

TravelSmart covers a wide range of initiatives, which seek to promote voluntary behaviour change in transport patterns. The program began in WA in 1996 and aims to reduce the number of trips made by car, through providing the skills and information needed to empower people to walk, cycle and use public transport where this is a practical alternative. TravelSmart applies ‘empowerment principles’ rather than telling people what to do.<sup>112</sup>

TravelSmart is one of a number of TDM strategies aimed at reducing the ‘impacts of car travel through reducing single occupant vehicle use, shifting to more sustainable travel modes, namely: cycling, walking and using public transport and reducing or removing the need to travel.’<sup>113</sup>

In WA, car driver trip reductions of between 7% and 14% are said to have been achieved as a result of TravelSmart initiatives.<sup>114</sup>

A comparison of surveys in the WA cities of South Perth, Victoria Park and Subiaco, where TravelSmart programs operate, between 1986 and 1998 demonstrated that, whilst travel distances have remained the same, people used their cars considerably more, resulting in 25% less cycling and 12% less walking. The survey also showed 84.5% of residents in inner city areas favoured policies that promoted environmental friendly modes of travel other than the car.

In his presentation to the Committee in Perth, Mr Gary John, Acting Manager of the TravelSmart Unit at the Department for Planning and Infrastructure, addressed the Committee on the TravelSmart Household Program, which is the largest of the three TravelSmart programs and is delivered on a suburb by suburb basis.

Mr John said:

“The TravelSmart program is about starting to realise some of those opportunities [for reduced car use] by giving people the information and motivation that they need to change their

perception of the world, to identify what those opportunities are and to take action.”<sup>115</sup>

Mr John also noted the Metropolitan Transport Strategy, which sets some targets to achieve a ‘more balanced’ transport system over a 30-year period. He stated the target is to reduce driver-only car trips by about 24.5 per cent from the projected trend over that period, from 70.5 per cent of all trips back to 46 per cent of all trips.<sup>116</sup>

He went on to say:

“What sorts of results have we been getting? We have detailed results now for South Perth, Cambridge and Marangaroo. As I mentioned, South Perth is an inner suburb, Cambridge is a combination of inner middle and Marangaroo is more of a typical outer suburb. These results are based on a travel diary that is taken from a random sample of the population in which the program is delivered.”<sup>117</sup>

In relation to results and benefits of the Program, Mr John commented:

“South Perth results show a 14 per cent reduction in car-as-driver trips. What that equates to is 3.4 million fewer trips across the population over 12 months. Public transport went up by 17 per cent or 420,000 extra public transport trips from that population over 12 months; cycling up by 61 per cent, which is 490,000 trips per year across the population; walking up by 35 per cent, which is 1.7 million additional walking trips across the population; and car sharing was up by nine per cent or 735,000 additional trips per year. We can see that the reduction in car kilometres was 36 million fewer car kilometres a year by that population. Therefore you see high benefit-cost ratios of 45 to one. If you compare that to typical urban road building benefit-cost scenarios, they are much lower: five to one and seven to one are often cited, if that in some cases.”<sup>118</sup>

Mr John said that people are still willing to change their travel behaviour if they are given the right information and motivation and:

“...delivering the program to half of Perth, as per the TravelSmart 10-year plan, would return something like a billion dollars in socioeconomic benefits over that period — that is, in things like reduction in car operating costs, pollution, greenhouse gases, mortality — those broad socioeconomic benefits. It would save the government \$12 million a year in extra fare box revenue. There are health service cost reductions and traffic management cost

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reductions by deferring the cost of road building and traffic management, such as traffic lights. It would reduce traffic by five per cent across the entire metropolitan area—or we are saying 10 per cent in the suburbs that we deliver the program in, on average — and something like 300 million kilograms of CO<sub>2</sub> per annum.”<sup>119</sup>

The TravelSmart Household Program has been adopted by the Commonwealth Government and is being replicated in Queensland, South Australia, Victoria, United Kingdom, Sweden, Germany, France and the United States.<sup>120</sup>

The Victorian TravelSmart program was established in 2001, under the management of the Department of Infrastructure (DOI), the Sustainable Energy Authority (SEAV) and the Department of Human Services (DHS). The stated objective of TravelSmart is to ‘achieve a reduction in growth of vehicle trips and kilometres travelled, through voluntary changes by individuals, households and organisations towards more sustainable travel choices.’<sup>121</sup> The program works in partnership with local governments to identify and promote travel mode alternatives to individuals, households and organisations.<sup>122</sup>

In a recent Victorian DOI publication on TravelSmart, it is suggested reduced car dependency has resulted in more people on the streets, less crime, more neighbourhood interaction and higher levels of physical activity.<sup>123</sup>

The TravelSMART program operating in Victoria consists of three programs:

- TravelSMART Workplaces;
- TravelSMART Schools; and
- TravelSMART Communities.

DOI highlights the TravelSmart Workplaces program helps employers to reduce the impact of work-related travel through a range of innovative strategies including green transport plans. Green transport plans incorporate biannual staff travel surveys that assist employers to assess the travel habits of staff and to measure progress towards sustainable travel objectives.

TravelSmart Schools is a curriculum based program for children in grades five and six that encourages healthy and sustainable travel to school. A range of curriculum materials are used to promote the benefits of physical activity and to raise awareness of the environmental impact of car travel.

The TravelSmart Communities program encourages members of local communities to “identify sustainable transport solutions that meet their travel needs for family commitments and social activities.”<sup>124</sup> The program involves contacting residents within a defined geographic area and providing them with information specific to their needs.<sup>125</sup>

DOI notes TravelSMART's stated aim is to benefit participants by:

- Saving time;
- Saving money from less car use;
- Improving personal health;
- Improving knowledge of local transport options; and
- Increasing local connections with neighbours and community.

DOI also notes TravelSMART's stated aim is to benefit the community by creating:

- Less car traffic on roads;
- Less pollution and greenhouse gases;
- Improved community health and wellbeing;
- Stronger local economies; and
- Improved community safety.<sup>126</sup>

**Recommendation 19:**

**The Committee recommends the Department of Infrastructure extend the TravelSmart program in Victoria, in addition to investigating other measures that are recognised as bringing about driver behavioural changes and reducing 'car dependence'.**

## **Urban design's role in reduced car dependency**

Australia-wide, the National Charter of Integrated Land Use and Transport Planning acts as a high level agreement between land use and transport planning Ministers and includes a number of aims to facilitate effective and sustainable urban and regional development across Australia through better transport and land use integration. The aims of the Charter include:

- Increased accessibility by widening choices in transport modes and reducing vehicle travel demand and impacts;
- Creation of places and living areas where transport and land use management support the achievement of quality of life outcomes;
- Increased opportunities for access to both the present and longer term; and
- A safer and healthier community.<sup>127</sup>

### ***Liveable Neighbourhoods***

The Western Australian Planning Commission (WAPC) introduced *Liveable Neighbourhoods*' which was mentioned earlier in the Report, for a trial period. The Code is currently being assessed to determine whether it should be the mandatory planning code for WA.

*Liveable Neighbourhoods* aims to promote a more traditional grid based street network for new developments and seeks to achieve compact, well-defined and more sustainable communities.<sup>128</sup> Its stated aim is the provision of “enhanced local identity, a wider choice of housing type, increased residential density over time, a more significant component of other land uses to support daily needs, including local employment and higher levels of public transport provision.”<sup>129</sup>

The *Liveable Neighbourhoods* Guidelines have a strong focus on pedestrian access, suggesting communities are based on a system of ‘walkable neighbourhoods’, which is defined as comprising land within a 5 minute walk or 400 metre radius.

In addition to creating an environment conducive to walking, other forms of non-motorised travel are also encouraged, namely cycling, which can be achieved through such measures as: bike parking facilities, slower vehicle speeds and low traffic volumes, appropriate (wider) lane widths along local streets to allow cyclists to share travel lanes with cars, wide kerbside lanes on busy streets and routes parallel to arterials with less traffic.<sup>130</sup>

WAPC argue, due to its basis being that of the traditional street pattern, cul de sacs are infrequent and the network of streets is highly connected, which provides for a “viable alternative to the need to drive from one land use to another, thus reducing traffic congestion on Arterial streets.”<sup>131</sup> The Guide states:

“All streets...have an important role in the urban structure. They contribute to community liveability by integrating all modes of travel including motoring, walking, cycling and using public transport; and by supporting active land uses on both sides. The emphasis is upon connectivity, amenity and integration to achieve safe, efficient and attractive street networks.”<sup>132</sup>

The following chart by WAPC illustrates the distinction between a conventional planning approach and a *Liveable Neighbourhoods* approach:

Table 3.3.4: The Conventional Planning and ‘Liveable Neighbourhoods’ approach

<b>Conventional Planning characteristics</b>	<b>‘Liveable Neighbourhoods’ Planning Characteristics</b>
Neighbourhood centres in cells bounded by arterial roads.	Based on walkable neighbourhoods clustered to form towns along transport routes.
Strong hierarchical curvilinear street pattern with cul-de-sac.	Interconnected street pattern with site-responsive network with high quality public open spaces as focal points.

Layout in accordance with subdivision standards for roads and open space.	Layout and performance objectives to provide a variety of lot sizes and housing choice, local retail, employment opportunities within the site and regional context.
Planning is characterized by large areas or zones of single land use and walled estates.	Fine-grained planning framework to ensure that employment and service centres are compatibly integrated with residential areas in neighbourhoods.
Limited planning for an integrated public realm (i.e. roads are designed predominately for cars).	Streets are designed to comfortably accommodate non-vehicular users and to support adjacent land uses.

Source: Western Australian Planning Commission (June 2000), *Liveable Neighbourhoods: Street Layout, Design and Traffic Management Guidelines*, Western Australian Government Planning Commission, Perth, p.4.

Despite early progress, Professor Peter Newman told the Committee (in relation to Perth):

“You go out to the eastern corridor and you have distinctly lower amenity and absolutely no centres. They are on the map and planners say ‘The centres exist’, but they do not in reality. There is shopping there and that is all. There are no jobs out there. There are no services for health and so on. It is just houses. We have essentially created a car dependence out there where they have to travel and these are the poor suburbs. The need for creating amenity in those suburbs with genuine urban options is the real challenge that we have.”<sup>133</sup>

**Recommendation 20:**  
**The Committee recommends that provisions of the *Liveable Neighbourhoods Community Design Guide* should be reviewed by the Department of Sustainability and Environment and the Department of Infrastructure for possible inclusion in the Victorian Planning Framework.**

Newman and Kenworthy outlined a number of strategies for reducing car dependency in Perth and these are outlined in the flowing table:

Table 3.3.5: Strategies for overcoming car dependence in Perth:

Traffic Calming	Favouring Alternative Modes	Economic Penalties	Non-auto-dependent Land Uses
<p>Central city area becoming progressively more traffic-calmed and pedestrianized, though much remains to be done.</p> <p>Traffic calming or local area traffic management practiced on ad hoc basis throughout the region.</p> <p>Some good examples in many local centres</p> <p>40km per hour zones around schools</p>	<p>High investment in upgraded and extended electric rail through the 1980s.</p> <p>Commitment to further extend the rail system.<sup>134</sup></p> <p>New bus service initiatives to improve cross-city travel (circle route), plus upgraded bus stops and information systems.</p> <p>A good off-road network of cycle-ways, especially for recreation and increasing attention to direct, on-road routes for commuting and other trips.</p> <p>Some favouring of pedestrian, cycle and transit access at regional centres over the last 5 years</p>	<p>Fuel tax, but used entirely for roads.</p>	<p>Recent extensive new central city housing projects, including revitalisation of old industrial land for resident/mixed use development.</p> <p>Beginnings of urban-village style development around rail stations through sinking of line at one station and large redevelopment project.</p> <p>A focus on land use planning to discourage car dependence in regional centres.</p> <p>Development of community code to encourage urban villages in any new urban development.</p>

Source: Newman, P. & Kenworthy, J. (1999) *Sustainability and Cities: Overcoming Automobile Dependence*, Island Press, Washington, p.235.

In a paper on urban density and travel levels, academic Patrick Moriarty compared two periods in Australia (the high public transport period of 1901-46 and the increasingly high car use period of 1947-1991), arguing:

“Reductions in vehicular travel, especially by car, have often been suggested as a way of reducing the problems high levels of urban traffic cause.<sup>135</sup> These problems include not only air and noise pollution, traffic intrusion and accidents, but also oil depletion and increasing concentrations of heat-trapping greenhouse gases.”<sup>136</sup>

Moriarty also highlights work by Newman and Kenworthy,<sup>137</sup> in which they demonstrated, for 1980, both per capita transport energy and travel itself, increased exponentially as urban population density increased. Moriarty also notes that, for Perth and New York<sup>138</sup> and Melbourne,<sup>139</sup> it has been found that personal travel levels increase with distance from the centre, whereas urban density decreases outwards from the centre.<sup>140</sup> He argues:

“...urban density changes are not the direct cause of the observed travel increases. Instead, the huge boost to travel convenience brought about largely by the shift from public transport to cars, best explains travel growth in post-war era.”<sup>141</sup>

He identifies lower urban densities as leading to decreased public transport patronage, while resulting in increased overall levels of personal travel.<sup>142</sup>

Moriarty questions the dominant driving force that has led to increased levels of personal travel in the post-war era, arguing it has come about as a result of the “great boost to travel convenience associated with the shift from public to private travel since the war.”<sup>143</sup> He believes ‘travel convenience’ has two parts.<sup>144</sup>

“The first, independent of traffic conditions, includes privacy, all-weather protection and ease of transporting young children or goods and varies little from city to city. With car air-conditioning and stereo systems and now car phones, it is increasing over time. The other part is traffic-dependent, varying with traffic speeds and ease of parking, both of which determine, for example, door-to-door travel times. Travel convenience in this sense not only varies somewhat from city to city, but also over a given city and by time of day.”<sup>145</sup>

In looking at options to combat car dependency, Moriarty states:

“Regardless of the main reason for travel increases, reductions can be effected by sufficiently high prices for motoring. Similarly, falling incomes for any groups will lower their travel demand. Such an approach would, however, be inequitable. Increasing urban density (which usually has the indirect effect of reducing car travel convenience) offers a



more equitable approach, but the very large changes required for significant results would not only take decades to achieve, but would face much opposition.<sup>146</sup>

Moriarty argues, strategies to reduce car dependency include lowering the traffic-related component of travel convenience as a means of curbing urban travel, which would involve such actions as:

- Street closures;
- An end to further urban arterial road building;
- Tighter parking restrictions in the CBD;
- Increased priority for pedestrians and public transport; and
- Reduced speed limits.<sup>147</sup>

### **The Adelaide O-Bahn**

The UDIA submission to the Committee highlighted the O-Bahn. The O-Bahn is a guided busway and was opened in 1986 to meet the transit needs of the growing population in the City's north-eastern suburbs, who needed to travel between their homes and the Central Business District (CBD).

O-Bahn buses travel on a separate concrete track, while they also travel on the road, which means passengers don't need to transfer to a different vehicle as they do with bus and rail systems and results in shorter travelling times.

The bus travels at speeds of up to 100km/h along the track without having to compete with other traffic. As a result, the bus is able to travel the 12km from the CBD to the north-eastern suburbs in only 20 minutes.

The system offers a high frequency of service, with buses able to safely travel on the corridor at 20 second intervals. The versatility of the system means the passenger catchment area is significantly larger than that of rail.

The operators stated its main features to be:

- At 12 kilometres long, the Adelaide O-Bahn is the longest and fastest guided bus service in the world;
- The O-Bahn carries more than 7 million passengers a year, with the system capable of moving 18,000 people an hour in each direction;
- The busway consists of 5,800 sleepers, 5,600 pylons drilled to a depth of 3 metres, 4,200 track pieces, 25 bridges, 8 pedestrian overpasses and a 60 metre-long tunnel;
- Compared with equivalent rail systems, the O-Bahn is almost 50 per cent cheaper to operate while providing a faster, more flexible service than many other transit systems; and
- At the time it was built in 1985-86, the entire O-Bahn project, (including the bus fleet) cost \$98 million.<sup>148</sup>

## **Public Transport in Brisbane**

In 1995, the Queensland Government developed the city's 'Busways' network, which is a rapid transport system using a range of buses utilising environmentally friendly fuel technologies. Busways aim encourage people to use public transport as a viable option to the car, due to benefits such as its speed, safety, frequency and station design/public safety benefits.

The network involves bus stations and interchanges connected by dedicated bus lanes, removed from other forms of vehicular traffic. Buses would service the low-density communities, picking up people on local roads and then joining the busway to bypass peak hour congestion. The busway stations would be developed at key nodes to service major activity centres.<sup>149</sup>

The Queensland Government adopted the Busways design as the answer to traffic congestion, in lieu of light or heavy rail expansion of the city's public transport. Construction was undertaken between 1999 and 2001.<sup>150</sup> The use of busways however, has been criticised by Professor Peter Newman, who argues Brisbane should abandon further plans to build busways and instead extend the heavy rail network and invest in building light rail.<sup>151</sup>

## **Best Practice in Melbourne**

This section of the chapter describes strategies and programs operating in Victoria: public transport and various forms of non motorised transport, such as walking, cycling and land use planning/infrastructure and the key policies and initiatives contained in *Melbourne 2030* and the *Victorian Greenhouse Strategy*, as they relate to strategies to reduce car dependency.

### ***Melbourne's demographics***

ABS statistics on vehicle use for Victoria are fairly consistent with the Australia-wide statistics outlined earlier in this chapter, indicating, in relation to motorisation levels, 9% (155,728) of Victorian households had no car, 35% (601,554) had one car, 35% (615,762) had two cars and 14% (248,773) had three or more vehicles, while 6.3% (109,526) did not state an option.<sup>152</sup>

In relation to modes of travel to work, with total labour force participation in Victoria at 60.9%, 61% (1,276m) people drove to work, 5.3% (109,752) were car passengers, 3.4% (71,039) travelled by train, 0.8% (17,489) by bus, 1.5 (30,521) by tram, 3.1% (64,732) walked and 0.9% (18,910) cycled to work.<sup>153</sup>

For the areas covered by Melbourne's interface councils, the levels of motorisation are outlined in the following table:

Table 3.3.6: Levels of motorisation in Melbourne's Interface Councils

Vehicle Households per Municipality (%)	NO vehicle	1 vehicle	2 vehicles	3+ vehicles	Not stated
Cardinia	4.3%	26.9%	41.5%	22.2%	5.1%
Hume	5.8%	31.4%	40%	17.3%	5.5%
Melton	4.2%	29.1%	43.1%	18.9%	4.7%
Whittlesea	5%	29.9%	40.7%	20%	4.5%
Nillumbik	2.8%	19.6%	48.2%	25.8%	3.5%
Yarra Ranges	4.6%	28.6%	41.6%	20.5%	4.7%
Mornington Peninsula	6.6%	36.6%	36.9%	13.3%	6.6%
Wyndham	5.1%	31.6%	41.8%	16.5%	5.1%

Source: Department of Sustainability and Environment *Melbourne in Fact 2001*, Victorian Government Department of Sustainability and Environment, Melbourne.

The table below identifies the major modes of people travelling to work, as reported in the 2001 Census, who reside in the interface municipalities.

Table 3.3.7: Major modes of travelling to work

Percentage per Municipality	Train	Tram	Bus	Car+	Car*	Walk	Cycle
<b>Cardinia</b>	1.4%	0%	0.3%	64.2%	4.8%	2.4%	0.3%
<b>Hume</b>	2.8%	0.1%	0.7%	67%	6.4%	1.3%	0.3%
<b>Melton</b>	3.5%	0%	0.3%	67%	6.5%	0.9%	0.2%
<b>Whittlesea</b>	3.3%	0.3%	0.6%	68.2%	6.4%	0.9%	0.2%
<b>Nillumbik</b>	3.3%	0%	0.3%	66.8%	3.8%	1.1%	0.1%
<b>Yarra Ranges</b>	2.1%	0%	0.5%	65.5%	4.8%	1.8%	0.2%
<b>Mornington Peninsula</b>	0.5%	0%	0.6%	61.7%	5.3%	3.1%	0.4%
<b>Wyndham</b>	3.5%	0%	0.4%	67%	6.6%	1.7%	0.3%

Source: Department of Sustainability and Environment *Melbourne in Fact 2001*, Victorian Government Department of Sustainability and Environment, Melbourne.

+ driver

\* passenger

In his recently published book 'Car Wars: how the car won our hearts and conquered our cities', Graeme Davison has noted it was common for Melburnians to regularly travel 30 to 40 kilometres a day between home and work, while, "Public transport became the transport modes of choice only for children, old people and the poor."<sup>154</sup>

Added to this is Davison's estimate that 80% of daily journeys in Melbourne during the 1990s were made by car, with more than 50% of Melbourne households owning two or more vehicles,<sup>155</sup> giving rise to a situation which he sees as:

"...signs that the rich are tiring of the long commute and embracing the delights of urban density. Walking or cycling

to work from a warehouse apartment, drinking coffee latte in a sidewalk café, sociability rather than seclusion are the new urban ideals. Now it is the poor, marooned in far suburbs, who are most car dependent on their cars and most vulnerable to the rising costs of urban sprawl.”<sup>156</sup>

## **Infrastructure Planning Council (IPC)**

As background to *Melbourne 2030*, in May 2000 the State Government formed the IPC to:

- Examine the infrastructure areas of water, energy, transport and communications;
- Advise on infrastructure needs for the next 20 years; and
- Look at how priorities should be determined.

The IPC’s interim report was released in October 2001, which made a number of recommendations in relation to transport, including the need to recognise the true costs of the private car, public transport and freight carried by road, rail, air and sea and the need to change incentive structures that might encourage people to use public transport and businesses to use rail freight.

Three priority areas were then identified:

- using incentives to make the transport system more efficient and sustainable;
- getting better value from existing transport infrastructure; and
- addressing future gaps in the transport system.<sup>157</sup>

In its report, the IPC proposed more work be done on pricing relativities of transport by road and rail. This would include price changes as a means of underpinning efforts to get people to switch transport modes and major upgrading of the public transport system to make it more attractive. *Melbourne 2030* also reported IPC’s comment that without adequate and realistic choice for users, incentives to move people away from cars had no chance of success.<sup>158</sup>

The Government’s response to the IPC report included a 15 year plan which, in relation to transportation, involved a series of recommendations to provide new or upgraded infrastructure and involved four key periods:

- Period 1 (2002-05) Set up and planning;
- Period 2 (2006-10) Implementation Phase;
- Period 3 (2011-2015) Implementation Phase; and
- Period 4 (2016-2020) Completion Phase.<sup>159</sup>

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## Urban Design and Health

The National Heart Foundation of Australia 'Supportive Environments for Physical Activity' (SEPA) Guidelines make the following recommendations:

### ***Street Networks***

- The local street network should be highly interconnected and shared by cycles, pedestrians and other vehicles;
- Footpaths are well lit with even, non-slip, well maintained surfaces;
- There is street furniture at selected intervals and locations and street lighting is appropriate to all users, not just motor vehicle drivers;
- Ramps and footpaths have gradients accessible to wheelchairs, prams and people with mobility difficulties. Prams and wheelchair crossings are provided at all intersections;
- Streets are shaded wherever possible by street tress/canopies (fixed or retractable) and street fronts are attractive and have soft edges, e.g. porches and shop fronts, rather than high, solid walls, garages and dense hedges; and
- There is a strong emphasis on community involvement in the development of their public realm.

### ***Neighbourhood destinations***

- A variety of destinations in local and neighbourhood clusters encourage people to be out and about meeting, talking, passing time and contributing to the local economy throughout the day. Local shops, post boxes and phone booths are retained as walkable destinations;
- Highly connected and physically improved pedestrian routes enable access to public transport stops and activity centres to be as easy as possible;
- Increased mix use improves street quality. Lighting, flexible use of buildings and crime prevention through urban design encourage more night time activity; and
- There is a sense of community ownership and responsibility for the public realm.

### ***Pedestrians and cyclists***

- Road design aims to emphasise shared space. Local Traffic Management Plans afford priority to public transport, pedestrians and cyclists over cars;
- Footpaths and cycle ways are free of obstructions such as tree debris and uneven surfaces. Being safe and easy to use, people are encouraged to be out and about;
- Motorists, pedestrians and cyclists are able to make dual mode journeys by provision of cycle facilities and the linking of public transport stops to other destinations; and
- Transport stops are safe, appealing to use and located close to activity centres.

### ***Development Layout***

- Higher lot density, accessible location of services and highly connected street layout minimize travel distances;
- New development encourages mixed use and reinforces public transport infrastructure;
- The local street and open space networks are highly connected; and
- Development contributes to an active street edge.<sup>160</sup>

### ***'Safer Routes to Schools'***

Tolley reports that "surveys of pedestrian schemes in Britain and Germany show that well-designed pedestrian schemes, coupled with improvements to public transport, increase retail turnover."<sup>161</sup>

In 1994 the Victorian 'Safer Routes to Schools' was established focusing on primary schools. The program identified education and engineering actions to improve the safety around schools. However, Tolley reports that for the 2003/04 year, no funding was made available for this program.<sup>162</sup> Tolley also notes in Victoria, approximately 75% of primary students are driven to school.<sup>163</sup>

In the UK, most local authorities have adopted Safer Routes to Schools programmes. The work is often set in the context of a 'School Travel Plan', which aims to:

- Improve safety and security for school children;
- Promote the health benefits of walking and cycling;
- Reduce the use of cars with their attendant problems of traffic congestion and air pollution; and
- Minimize demands on local education authority transport budgets.

Tolley reports that approximately 1080 School Travel Plans had been implemented in the UK by March 2002, with approximately 5000 planned by 2006.<sup>164</sup>

Tolley also highlights the success of the 'Walking Bus', which began in 1998 and involves school children being escorted to school via a virtual bus, with parents acting as drivers and conductors.<sup>165</sup> In 2001 VicHealth contracted Victoria University's Wellness Promotion Unit to undertake an evaluation of the first twelve months of VicHealth's Pilot Walking School Bus program.<sup>166</sup>

During the pilot program, the following four Victorian councils participated: City of Greater Dandenong, Campaspe Shire Council, Whittlesea Shire Council and the City of Port Phillip.<sup>167</sup> The evaluation, which was published in 2003, identified the program as being a success and resulted in VicHealth funding a further 29 councils to implement phases 2 and 3 of the Program in 2002/03, involving 145 primary schools.<sup>168</sup>

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## ***Design for disability issues***

Tolley states that:

“Environments all over the world have been built without much thought to how they should perform for people who can’t walk, see or hear. Consequently, people with disabilities have been isolated and segregated from the rest of the population.”<sup>169</sup>

Tolley highlights basic considerations that need to be considered when designing pedestrian environments, such as providing adequate clear space on footpaths, along passages in public buildings, for example, through doorways, ensure lighting is sufficient for people who are visually impaired and in relation to train or bus timetable information, ensure it is of a sufficient print size.<sup>170</sup> Tolley recommends that, when developing Local Transport Plans and local bus and walking strategies, a system of auditing access problems should form part of the process of developing guidance, strategies and implementation programmes.<sup>171</sup>

On the issue of disability access, DSHA’s submission to the Committee recommended that access, road user safety and health issues be part of an integrated urban design framework for Victoria.<sup>172</sup>

## ***Public Transport***

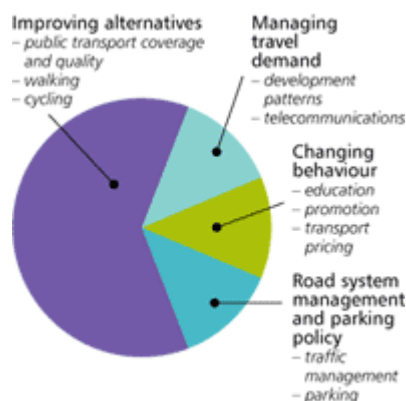
Currently, only 9 per cent of motorised trips within the metropolitan area are made on public transport, while the *Growing Victoria Together* target is 20 per cent by 2020.<sup>173</sup>

*Melbourne 2030* noted major upgrades in public transport capability would be undertaken, involving: expanded coverage and improvements in speed, reliability, ease of use, amenity and safety.

The Strategy also makes provision for the establishment of a Principal Public Transport Network, which builds on existing train and tram services and creates new cross-town bus services between Principal and Major Activity Centres in metropolitan Melbourne, while local public transport (especially bus) services will be improved, with a key focus being to services in middle and outer metropolitan areas.<sup>174</sup>

These initiatives can be summarized in the chart below, taken from *Melbourne 2030*:

Figure 3.3.2: Travel changes



Source: <http://www.dse.vic.gov.au/melbourne2030online/>.

In relation to public transport options, the submission received from the Shire of Yarra Ranges noted that major public transport infrastructure is located on the fringe of the Shire, which they argue, entrenches car dependency. The Shire's submission calls for an extension of rail based services and ask why *Melbourne 2030* does not include plans to use existing land and rail infrastructure along the Lilydale to Healesville corridor.<sup>175</sup>

PIA (Vic)<sup>176</sup> advised the Committee:

“At present there appears to be too great an emphasis on increasing housing density without giving due recognition to the importance of high quality public transport services to ensuring this increased density does not end up being associated with reduced livability due to continuing high levels of car ownership and private travel. For example, some inner city medium to high density developments, such as Beacon Cove, have not seen a reduced level of car ownership and increased public transport usage despite proximity to local retail, community and high quality public transport services such as the 109 tram line, replete with ‘super stops’.”<sup>177</sup>

In response to the question in the Committee's discussion paper on the contribution urban design can make to reducing car dependency, the submission from PIA (Vic) noted:

“Sub-regional, activity centres and neighbourhood designs can help to encourage walking and alternative transport through provision and placement of facilities and services...but ultimately, modification to the metropolitan transport system (road, rail, tram) remains within the domain of the State Government to really effect substantial changes.”<sup>178</sup>



The submission from the Mornington Peninsula Shire questioned the motive for increasing the proportion of trips using public transport, noting: “if the issue were primarily one of pollution, then the focus on less polluting private transport may be a more effective response.”<sup>179</sup> They stress the importance of coordinating development in activity centres that are connected to public transport and: “any significant increase in public transport use in fringe areas (which are still the major population growth areas under *Melbourne 2030*), will require a major commitment to recurrent funding... .”<sup>180</sup>

On this issue, Mr Trevor Budge from PIA (Vic) told the Committee:

“If you look at public transport use in our regional centres, it is around 3 per cent. It is 9 per cent in metropolitan areas, but 3 per cent in our regional cities. The chances of them ever being able to sustain public transport and not have it heavily subsidised are extremely difficult even in the medium to long term.”<sup>181</sup>

Mr Budge also stated: “until the 1950s we had an urban area that was basically dependent upon its transport system as the drivers of corridor development. But we have lost that and this is a critical issue that we think should be incorporated.”<sup>182</sup>

This point was followed up by Ms Rosemary Cousin, also from PIA (Vic) who noted:

“There are certainly a lot of merits in having not just individual centres but linkages between the centres in terms of transport services. This can be bus services as well. It is about the built form in terms of growth centres, but it is also about the connections, the movements, spaces and activities that go on between them - to see that we are generating an urban network rather than just creating a built form and not thinking about those networks and linkages. It is about how we make the city work better and more efficiently. To me, that is an overall sustainability question.”<sup>183</sup>

Mr Stephen Thorne, then from DSE, told the Committee:

“On this issue of reducing car dependence and therefore the relationship back to greenhouse reduction, as we know, private motor vehicles are a substantial component of greenhouse gas emission. The provision of alternatives so that people have choice in terms of how they access their basics needs as well as their daily requirements is a key issue. It is about providing access for people who do not necessarily have access to private vehicles — there I am thinking of people under the driving age, elderly people,

people in single-car homes where that car is being used for some other activity — who are then left without choice. So the issue is about how we can actually develop around public transport infrastructure such that walkable catchments are maximised and people have the choice of walking. It does not mean they have to walk, but they have a choice at least.”<sup>184</sup>

In response to a question in the discussion paper on the impact the UGB will have on land prices and housing affordability, PIA (Vic), in their submission to the Committee, stated:

“With regard to the UGB, it should be noted that levels of vehicle ownership per household is markedly higher in outer and fringe urban areas, compared to inner suburbs of Melbourne, due to both reduced or non-existent public transport alternatives, as well as unsafe pedestrian and cycling environments, greater distances that need to be travelled due to inefficient road layouts, larger catchments for schools, inadequate provision of local retail and community facilities and lack of local employment opportunities. This higher level of vehicle ownership is significant (RACV 2002 Car operating cost estimates of \$5000-\$8000 per year per vehicle) and therefore adds considerably to the recurrent costs of housing in outer areas. Any genuine interest in housing affordability implications of land supply on the fringe of Melbourne needs to also take the financial and social cost to the individual householder of access and mobility into account.”<sup>185</sup>

PIA (Vic) also provided a detailed submission on the role of public transport and its linkage with *Melbourne 2030* and urban design. In response to a question in the Committee’s discussion paper on the role urban design plays in shaping the future of public transport, PIA (Vic) commented:

“Transport infrastructure planning and provision lies essentially with the State government – whether the infrastructure is actually provided by public or private funds. Urban design can point to the need for and accommodate better, transport systems in new and existing urban areas. It is relatively limited in its capacity to secure infrastructure investment decisions. However, “intelligent” urban design of public transport nodes, e.g. in accordance with CPTED principles, will foster a more positive qualitative experience associated with public transport than is currently the typical experience, especially compared to private travel by car. This is particularly in relation to actual and perceived safety, amenity and social status.”<sup>186</sup>

In addressing the question of whether the existing public transport system has the capacity to cater for the patronage target of 20% by 2020 and if not, what is needed for the Government to achieve its vision of 20% of motorised transport trips taken on public transport by 2020, PIA (Vic) stated:

“While specific answers to the first part of this question must come from the transport providers, intuitively, it appears so, especially in non-peak times. The frequency of services, including night time and weekends and perceptions of safety are all-important factors in achieving the set target. So too is overcoming the current shortfalls in the transport system especially the limited reach of the main metro transport network into outer and peri-urban areas and the lack of between-centre connections, require progressive infrastructure investment. At present, roads are funded automatically and without being subjected to short and long term “viability” and cost implication assessment, compared to public transport provision (or more usually non-provision) in fringe urban areas. Government needs to adequately fund “Transport” infrastructure and acknowledge public transport as an equally important (and fully funded) element of any new development if approval for that development is to be granted/allowed. This possibly suggests the needs for a review of existing governmental agencies and departments in order to bring transport into a fully integrated decision-making unit, rather than current arrangements whereby road planning and funding occurs independently from decisions around public transport provision. Alternatively, some other form of “whole of government” decision-making needs to be established, with appropriate accountability mechanisms in place, to ensure public transport does not continue to be seen as a much belated component of infrastructure planning, funding and provision.”<sup>187</sup>

The submission from the Urban Development Institute of Australia (UDIA) noted, in relation to public transport:

“Without major structural works in many locations around the metropolitan area, it will be very difficult and almost impossible to achieve the ambitious target of increasing the proportion of all journeys from the present level of 9% by public transport to 20%.”<sup>188</sup>

UDIA’s submission then goes on to state that:

“More than new infrastructure – for which no commitments are made – major rescheduling of services on what is presently a system under stress at the peaks and artificial

and arbitrary prioritising of buses and trams will be needed. The necessary attitudinal and cultural change may not be achievable even as intermediate targets. If that direction fails, *Melbourne 2030* is in jeopardy as well.”<sup>189</sup>

UDIA’s submission argues that little has been done in outer suburban areas to promote public transport, with the decline in public transport usage being the result of inadequate forward planning and funding.<sup>190</sup> Their submission highlights areas where improvements could be made. In the east, the submission recommends bus services, while there may be a limited opportunity to add to the rail network. In the west, the UDIA states both commuter and freight is possible and desirable for the Werribee growth area. In the north, the UDIA believes budget commitments are required, rather than “preserving the option of a fixed rail line from Epping and road improvements.”<sup>191</sup>

UDIA’s submission informed the Committee that people in the outer suburbs are car dependent, as the public transport system has not been developed and:

“As a result, people living in those areas – particularly in the newer locations between the radial train lines where connecting bus services are either non-existent or badly scheduled – residents have no option but to rely on cars. In time, as the population consolidates, these other services will become available, but if endeavours to reduce car dependency are to be successful, then these feeder services must be provided at an early stage in development in an effort to educate the travelling public and to influence use patterns.”<sup>192</sup>

UDIA are supportive of the ‘Park and Ride’ scheme, in addition to the O’Bahn, the combined road/rail scheme successfully operating in Adelaide.<sup>193</sup> Both these schemes have been discussed in this chapter.

In its submission to the Committee, the Mitchell Shire stated that, for a municipality on the fringe, public transport is either limited or non-existent. Their submission argues:

“Unless the form and structure of new residential, commercial and community centres is radically altered, the provision of public transport will continue to be ineffective in fringe metropolitan locations. The responsibility for an improved approach rests with the development industry and government and a more educated expectation by consumers.”<sup>194</sup>

The Shire of Mitchell's submission makes a number of recommendations as part of an 'eight point plan'. In relation to this chapter, two of these are relevant and involve:

- Examine the potential for the expansion of available public transport services within all townships of the Shire;
- Review the long term needs and potential development opportunities associated with the transit interchange facilities within the Shire.<sup>195</sup>

**Recommendation 21:**

**The Committee recommends the Department of Infrastructure undertake research to investigate best practice examples in other Australian jurisdictions, relating to accessible electronic passenger timetables, route maps and seats and shelters located in key transit locations. The Committee further recommends the Department of Infrastructure report on how these features can best be introduced into new and expanding communities serviced by public transport.**

On 19 February 2004, the State Government announced changes to the metropolitan public transport system, with Yarra Trams running the tram system, including those formerly operated by M>Tram, for the next five years with an option to extend the contract by a further two years, while Connex would operate the metropolitan train system, including those lines formerly managed under contract by M>Train, for a five year period, with an 18 month extension option.<sup>196</sup>

In its submission to the Committee, the MAV Interface Councils group addressed questions presented in the Committee's Discussion Paper. In regard to public transport capacity and the Government's target of 20% patronage by 2020, the Interface Councils group believed it was unlikely to be achieved at the interface.<sup>197</sup> The submission from the Shire of Yarra Ranges addressed the same question but on a different angle, believing:

"The problem of public transport use is not just availability, but more to do with destinations – understanding employment, cultural and other needs must be the main focus. Concentration on just public transport will not bring about good urban design outcomes. We must use all principles of *Melbourne 2030* to achieve it – each has significant weighting."<sup>198</sup>

The submission from the Interface Councils stated that *Melbourne 2030* did not deal with public transport issues sufficiently, with the plans relating to

existing bus, tram and rail provision, rather than new infrastructure and services.<sup>199</sup>

The Interface Councils also address the contribution urban design can make to reduced car dependency, believing urban design can make a significant contribution through:

- Co-location and accessibility of destinations
- Designing accessibility by foot, cycle and public transport
- Creation of high amenity neighbourhoods.<sup>200</sup>

In response to this issue, the Shire of Yarra Ranges submission calls for the adherence to a ‘simple hierarchy’ when providing for a new development built on sustainable urban design principles, which involves the provision of facilities for pedestrians, cyclists, public transport and vehicles – and in that order.<sup>201</sup>

The Interface Councils also believe, in an effort to encourage people to modify their preferred travel mode, “behavioural change will not happen without an increase in reliable transport infrastructure and service. This must be available early in the development to effectively change travel behaviours.”<sup>202</sup> While the Shire of Yarra Ranges believes people predominantly choose transport methods due to whether the service travels to where they want to go, followed by other components, such as convenience and cost, the Interface Councils recommend the following five enhancements to encourage greater public transport use:

- Service extensions;
- Service frequencies;
- Quality of stock;
- Cross town links; and
- Perceptions of safety.<sup>203</sup>

**Recommendation 22:**

**The Committee recommends the Victorian Government work with the Federal Government to provide additional funding for public transport within outer suburban and interface areas.**

The submission from the Public Transport Users Association (PTUA) raised a number of issues related to public transport service provision. The submission states: “We can only conclude that the provision of public transport is the main determinant of whether people will use it.”<sup>204</sup> Their submission highlights what the PTUA consider the critical components of public transport, which include:

- Route coverage
- Frequency/span of service
- Reliability
- Speed
- Coordination.<sup>205</sup>

In relation to public transport, the PTUA recommended the following:

- The establishment of an integrated public transport planning and marketing authority to redesign bus routes and timetables with a view to revising routes, extending operating hours, improving service frequencies and improving coordination with trains.
- The adoption of BusPlan to provide better public transport in the majority of Melbourne beyond walking distance of trains and trams.
- The completion of rail projects<sup>206</sup> to extend the reach of the rail system to growth centres and corridors.
- 10 minute service frequencies on the metropolitan rail system day and night (15 min late night).
- Public transport service standards for new developments (e.g. 80% of the population within 1km walk of a seven day service running every 15 minutes of better).<sup>207</sup>

**Recommendation 23:**

**The Committee recommends a feasibility study be undertaken into the coordination between different public transport modes and should include specific reference to services, availability, frequency and route and timetable extensions in interface areas.**

At a Committee public hearing, Mr Chris Ellison, then representing M>Train, commented on the importance of railway station locations:

“The walking distance catchment is very important for the rail system. Overall, over half the people who travel by train get to their station by walking to it. However, in outer suburbs that percentage can drop quite dramatically.”<sup>208</sup>

Related to the issue of the walking distance to train stations, Jan Scheurer from RMIT University told the Committee’s October 2003 briefing:

“In outer suburbs, you get a share of something like 84 per cent from car, only 4 per cent public transport – and it is really no miracle if you look at the quality of public transport provision out there and also the very small percentage of non-motorised transport, particularly in the low-density

areas that are too spread out to be walkable and cyclable. In the inner suburbs, the tram suburbs, as far as the tram system reaches in Melbourne, you still have about 60 per cent of trips by car, but a much higher share of public transport and also a much higher share of non-motorised transport.”<sup>209</sup>

Building a public transport culture and strengthening land use/transport integration, in line with *Melbourne 2030*, were viewed by John Stanley from the Bus Association Victoria as the key to solving deficiencies in the public transport system.<sup>210</sup>

Mr Stanley believed building a public transport culture would involve substantially increasing the frequency of public transport services, especially to middle and outer suburbs, improved reliability, better information and marketing, better transport/land use integration, car users to be made accountable for the full community costs of their travel, which would result in public transport performance that is much more competitive with the car in accessibility terms.<sup>211</sup>

In a detailed and extensive submission to the Committee, Mr Alan Parker focused his submission on reducing car and oil dependence as the basis of preventing the economic decline of outer urban areas by 2030. His submission proposed a cycle network that was linked and coordinated, while he made a number of proposals, such as suggestions that bicycles should be used as a substitute for short trips in which there is only one driver and a suggestion that powered electric bicycles be a substitute for car trips of less than 10km.<sup>212</sup>

In his presentation to the Committee in October 2003, Dr Paul Mees from Melbourne University made the following comments in relation to public transport and urban design:

“...the primary point I want to make is that while I am sure that you will receive many good submissions about sensible things that can be done to improve the urban design of our new suburban neighbourhoods, the contribution that urban design can make by itself to reducing car dependency – and particular increasing walking – it seems to me is virtually nil and has been greatly overstated by a number of participants in the discussion about urban design.”<sup>213</sup>

Dr Mees added to this comment with the following observation:

“The research, such as it is, that tends to support the idea that is the fault of urban design, points out that the urban form of Fitzroy is very different from the urban form of Whittlesea or other outer suburbs of Melbourne. And we



quickly rushed to the conclusion that it must be the urban form that accounts for the difference. But I don't believe that that is the case. Because, in fact, if you look even to other parts of Australia, you find that outer suburbs with urban forms that are much less friendly to public transport and walking even than Melbourne's, are provided with much superior public transport services."<sup>214</sup>

Dr Mees described to the Committee, comparisons between urban design and public transport systems in Melbourne, Perth and Canberra and noted:

"It is not urban design that explains why this is happening, because the urban design of these outer suburbs of Perth is much worse than anything in Melbourne, because Perth has had much weaker land use planning than Melbourne has. Canberra has had stronger land use planning, paradoxically, but that land use planning was not until very recently, underlined by all the ideas of suburban design that urban designers now reckon are no good. So these areas generally have lower densities than Melbourne's outer suburbs, less walking-friendly street patterns but much, much better public transport."<sup>215</sup>

In speaking about ways to encourage walking and provide for walkable neighbourhoods, Dr Mees told the Committee:

"The assumption we tend to make in Melbourne is that you start with good urban design and this causes walking to happen and somehow that makes public transport viable. In fact I think it is the other way around. That is why I really believe that the answer to this question lies in this thing we all talk about but don't do – transport land use integration – meaning your transport policy needs to support your land use policy. This is where Melbourne falls down: there is no point designing walking-friendly neighbourhoods if you don't provide public transport because no-one will walk anywhere and all the corner stores will go broke, because once people are in their cars they drive past them on the way to the regional centre."<sup>216</sup>

As a short term measure to increase service provision in the outer suburbs, Dr Mees suggested: "The secret of success seems to be to try to use the local bus services that you have to provide every week to get people to the station, among other things, to double as the cross-suburban bus service."<sup>217</sup>

**Recommendation 24:**

**The Committee recommends the Department of Infrastructure and the Department of Human Services, in conjunction with the Municipal Association of Victoria interface group of councils, undertake an assessment to determine the availability of, and demand for, local buses that could be used during off peak times as cross suburban passenger or community services buses.**

In a presentation to the Committee, representatives from the Department of Infrastructure (DOI) provided quite a different perspective to that of Dr Mees. Mr Ray Kinnear, Acting General Manager, Business Development outlined a number of rail extensions, stating:

“We [DOI] have been fairly active in improving public transport services to the developing suburbs of Melbourne over the last three or four years.”<sup>218</sup>

Mr Kinnear went on to identify four key elements that are required for improved public transport provision:

- Ensuring there are reservations in place for future corridor needs;
- Limited extensions to rail lines;
- Expansion of rail lines in localities where patronage is approaching capacity limits, due to increasing population growth in the area; and
- DOI are working with developers and councils in planning new rail stations, as suburbs develop, for example: Lynbrook, Pakenham Park and Point Cook.<sup>219</sup>

In relation to a question concerning the potential for taxis competing with fixed route transport as part of public transport delivery, Mr Kinnear commented:

“The work we have done to date suggests that it is probably not a widespread solution because of the costs involved; you end up with a very high price structure around it. So we don’t see this as a widespread application. There are a couple of cases of demand-responsive services which have been running in the Chirnside Park and associated areas for a number of years and that works well in that particular sort of environment. But we are not being pushed by bus operators or the taxi industry to be doing that sort of thing on a widespread basis.”<sup>220</sup>

During the same presentation, DOI’s Mr Peter Harris, in response to a question from the Committee Chair, Mr Don Nardella, concerning what is needed at the planning stage for a sustainable community, responded: “Most

estate developments require cooperation with the local authorities on water, electricity and a road plan. There is no obligation to have a public transport plan.”<sup>221</sup>

**Recommendation 25:**

**The Committee recommends the integration of public transport services be a mandatory requirement for the development of new communities in outer suburban areas.**

***Walking and Cycling***

In relation to walking and cycling, *Melbourne 2030* highlights “the importance of providing safe, attractive and continuous pedestrian and cycling routes and facilities, on and off-road, as an integral part of new and existing urban development.”<sup>222</sup> As a result, the Strategy provides for the completion of the Principal Bicycle Network.

DSE’s Stephen Thorne told the Committee on 15 September 2003, about the idea of designing walkable neighbourhoods which can be described as ‘urban villages’:

“[are typically] defined as an area with a 400 metre radius circle around a particular centre. That does not mean everyone has to live in those urban centres. You have choices: you could live in a slightly more clustered development or you can choose to live outside of that, which is much lower in intensity and density. So there are these ways in which we can start to structure urban development to facilitate walking to centres. Again, this comes back to the lower car usage, that if you design in such a way that people have the choice to walk, then potentially you are not using X number of cars. If you think about it in terms of not having to have the second or third car because you can actually walk to things, then that is a significant amount of money, potentially, onto the mortgage.”<sup>223</sup>

In relation to *Melbourne 2030*, Tolley has suggested the majority of the nine ‘directions’ of *Melbourne 2030* are directly relevant to the provision of better facilities for pedestrians. Tolley’s suggestions of most relevance are:

- Direction 1 (A More Compact City)
- Direction 5 (A Great Place to Be)
- Direction 6 (A Fairer City)
- Direction 7 (A Greener City)
- Direction 8 (Better Transport Links).<sup>224</sup>

Tolley outlines eleven issues affecting whether or not people walk and these factors are identified in the table below:

Table 3.3.8: Eleven issues affecting whether or not people walk

<p><b>Personal safety.</b> Crime - or the perception of crime - is a major deterrent to walking, especially for women and older people. Surveys of pedestrians and their fears should be used to develop strategies to make places safer for all users.</p>
<p><b>Road safety.</b> Rather than restrict the movement of pedestrians, a "Road danger reduction approach" is promoted which seeks to provide a safer environment for all users. Vehicle speed control has been widely adopted in Victoria as a means of making our local streets safer.</p>
<p><b>Health issues.</b> Increasing obesity and related health problems call for the development of urban environments that encourage activity. The Australian Heart Foundation SEPA (Sustainable Environments for Physical Activity) Guidelines are referenced as a model solution.</p>
<p><b>Social exclusion.</b> This occurs when the residents of an area suffer from a range of linked problems: high unemployment, poor local facilities, limited public transport and poor walking environments. Many problems are associated with poor accessibility and the solution involves a mix of better land use planning and the capacity for people to access what they need - preferably at low cost, in safe environments and on foot.</p>
<p><b>Walking adds value to our environment.</b> Places providing good walking environments are attractive to participants in the "new economy" and improvements to walking can positively impact on property values, liveability, the environment and efficient land use patterns</p>
<p><b>Walking and the public transport system.</b> All public transport journeys begin and end with a walk trip, some are short and some are quite long. The location of stops, the quality of waiting places and the safety of passengers at their stops and on their journeys to/from stops are important. Public transport services rely on a supportive walking environment.</p>
<p><b>Walking to school.</b> In Melbourne, 75% of primary children are driven to school, resulting in local congestion and high greenhouse gas and pollutant outputs. Meanwhile, many children have insufficient exercise and lack skills in navigating their local neighbourhoods. School Travel Plans can provide safe solutions to these problems</p>
<p><b>Walking to Activity Centres and local shops.</b> Almost a quarter of the trips for shopping and related activities are walked in Melbourne, but there are many gaps in the links between home and the centres. There is scope to reduce the use of the car for short trips and to improve the environment and</p>

the economic performance of centres.

**Walking to work.** The extent of walking to work can be increased through a variety of campaigns - either firm-based, like 'Walk in to work out!', or through state agencies (TravelSMART workplaces in Victoria). Walking is often part of a public transport trip to work.

**Design for disability.** Over 20% of the population has some form of disability and good design which assists pedestrians can go a long way to satisfying the needs of those with disabilities. However, when special needs are met, such as providing for the visually impaired, the general population benefits as well. A number of new resources that give advice on design are provided.

**Engineering standards.** It is important to design streets for people. The "5C's checklist" provides basic guidance on making all walking routes "Connected, Comfortable, Convenient, Convivial and Conspicuous". This section also provides advice on pedestrian facility audits. New tools are available for this purpose.

Source: Tolley, R. for the Department of Infrastructure (July 2003) *Providing for Pedestrians: Principles and guidelines for improving pedestrian access to destinations and urban spaces*, Victorian Government Department of Infrastructure, Melbourne, pp.1-2.

In order to gauge the level of awareness amongst health planners of health issues, a survey of 100 Victorian planners undertaken on behalf of PIA (Vic) in December 2002, reported the following results:

- When asked what they saw as being the major health issues facing people in Victoria, all respondents across the sample mentioned the lack of access to health services in general, the cost of health services, the air and water pollution and the lifestyle issues, including lack of exercise and poor diet leading to obesity and cardiovascular problems;
- The respondents strongly agreed that currently about 60% of Victorians were overweight or obese. They were conscious Victorians were too reliant on their car instead of walking, cycling or using public transport. Along with poor diet, this was reported to be one of the reasons for the growing problem of obesity amongst the Victorian population; and
- The planners thought they definitely had a role in creating a healthier, more physically active community. Their main role was to assist in designing attractive and safe public places, cycling paths, good public transport link and encouraging the generation of more local facilities in the neighbourhood. The private planners were more likely to think they had a role in creating a healthier, more physically active community when compared to the local Government or State government planners.<sup>225</sup>

The survey demonstrated planners perceived a link between health issues and planning. The majority of respondents reported that planning could definitely assist in providing the appropriate infrastructure to encourage people to live a healthy lifestyle, for example, providing cycling and walking paths, recreational facilities and access to public transport.

The report recommended consideration could be given to the following areas:

- Review of legislation particularly for planning permits and its compatibility with promoting healthy lifestyles within the community;
- A general information program provided to all planners in all different areas and other key parties involved (engineers, urban designers);
- A more efficient dissemination of information regarding major planning and health events held in Victoria (via the internet, newsletters, professional magazines);
- The easy access to seminars and conferences on this issue (in regional and country areas and at appropriate times);
- A consultation strategy with the community to further understand their needs; and
- A closer link between planners and other health professionals.<sup>226</sup>

### **The Contribution of Reduced Car Dependency to the achievement of *Melbourne 2030* and the *Victorian Greenhouse Strategy***

As noted earlier in the Report, *Melbourne 2030* contains a strategic framework, which involves a vision, principles and key directions. A series of policies and initiatives flow from this strategic framework, which are to be implemented through a range of initiatives.

One of the stated aims of *Melbourne 2030* is it “seeks to channel future broadhectare growth, at gradually increasing densities, into five designated growth areas<sup>227</sup> well served by public transport.”<sup>228</sup>

As part of the consultation process involved in developing and progressing *Melbourne 2030*, a number of residential and industrial development forums were held in late May and early June 2003 with interest groups, including local councils, developers, infrastructure providers and real estate agencies. In DSE’s Urban Development Program 2003 Report, the department noted comments made during the forums regarding difficulties with making investment decisions concerning the capacity of transport and water services that will be required to meet the long term needs of future residents and businesses.<sup>229</sup>

DSE noted that forum attendees raised issues regarding:

“...the provision of transport infrastructure and the need to integrate land use and transport planning. Of particular

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concern was the commitment to and timing of, the provision of public transport infrastructure and services in order to provide an alternative to the private car.”<sup>230</sup>

In relation to the *Melbourne 2030* initiative, the submission to the Committee from the Frankston City Council<sup>231</sup> outlined the process involved in preparing their Structure Plan for the Central Activities District (CAD), in line with *Melbourne 2030* and the Transit Cities initiative.<sup>232</sup> While the submission noted work to date indicates support for the integration of residential living opportunities into the CAD, a number of issues have arisen, including those associated with density/intensity of development, environmental and sustainability implications and social and infrastructure considerations, while:

“It is also becoming more evident that the success of the Transit Cities program may well hinge on a successful whole of government approach. The integration of education (TAFE) and health facilities into the CAD and a commitment to fund the necessary improvements to public transport infrastructure and services must occur to create the right mix of activity and for the Government to drive the change/renewal process by example.”<sup>233</sup>

*Melbourne 2030* also contains a number of ‘directions’, resulting from the policies and initiatives outlined above. Where these are relevant to achieving reduced car dependency, they are attached as *Appendix E*.

In helping to achieve *Melbourne 2030*, initiative 1.1.3 (‘More Transit Cities’), involving improvements in access to public transport, programs designed to achieve integrated public transport and the TravelSmart program are relevant.

Initiatives 2.3.1 and 2.3.2 make provision for infrastructure facilities, such as roads and bus services, to be provided early in the development cycle and elements of the Western Australian State Sustainability Strategy outlined earlier in this chapter, the Liveable Neighbourhoods ‘Community Design Guide’ and the National Heart Foundation for Australia, SEPA Guidelines, also noted earlier, are relevant.

Initiative 8.2.1, which aims to improve ‘cross-town’ bus services and public transport times, could be enhanced through ‘Park and Ride’ schemes and through adopting the Committee’s recommendation of using local buses during off peak times as cross suburban passenger or community services buses.

### ***National Greenhouse Strategy***

On 26 November 1998 the Commonwealth Government released the National Greenhouse Strategy, subtitled as the ‘Strategic Framework for

Advancing Australia's Greenhouse Response'. The Strategy consists of eight modules and appendices. Module 5 is titled efficient transport and sustainable urban planning.

The AGO has estimated Australians have amongst the highest *per capita* greenhouse gas emissions from transport use in the world,<sup>234</sup> due to factors, including a high rate of ownership of passenger vehicles and a high level of domestic freight activity per capita arising from Australia's low population density and vast size.<sup>235</sup>

Module five outlines measures in the following key areas:

- Integrating land use and transport planning;
- Travel demand and traffic management;
- Encouraging greater use of public transport, walking and cycling;
- Improving vehicle fuel efficiency and fuel technologies;
- In addition, the National Greenhouse Strategy provides for:
- Studies into the establishment of fuel quality standards;
- Programs to improve the maintenance of in-service vehicles to reduce fuel consumption;
- The dissemination of information to transport users on the financial, social and environmental impacts of transport use and of alternative transport modes; and
- Increasing the use of alternative fuels such as CNG.<sup>236</sup>

Module Five of the Strategy includes an annex detailing various measures, both existing and additional, which are linked to responsible states and territories and indicative timeframes.<sup>237</sup>

The Strategy aims to reduce greenhouse gas emissions by influencing travel choices and behaviour. This includes:

- *Action 7.1*; Assessment of the Government's contribution to major road projects against economic, social and environmentally sustainable criteria (in particular, the reduction of greenhouse gas emissions);
- *Action 7.2*; The establishment of partnerships between local and public transport providers to pursue reductions in car-based travel;
- *Action 7.4*; Funding a Safe Walking and Cycling Routes to Schools program; and
- *Action 7.5*; determining the most appropriate role for State Government in promoting preferred transport fuels and technologies.

In relation to the *Victorian Greenhouse Strategy*, a number of programs contribute to helping achieve the Strategy's initiatives. The Strategy identifies the Victorian transport sector, as at 1999, as contributing 16% of total Victorian emissions, which was a 12.6% increase from the 1990



figure<sup>238</sup> and includes the following actions, many of which overlap with 2030 initiatives:

- **Integrated Transport Investment Framework** ('package' funding approach to help create 'cross modal' transport solutions);
- **Victorian Travel Behaviour Change Program** (develops partnerships between local government and transport operators to encourage greater use of public transport, walking and cycling);
- **Market testing of improved bus services** (focuses on middle and outer suburb bus service upgrades, such as route reconfiguration, improved service frequency and service priority);
- **Safe walking and cycling routes to schools program** (funding for 30 schools over 3 years, to reduce the number of car journeys to school);
- **Determining Victoria's role in promoting the use of alternative fuels/technologies** (study into fuel and vehicle technologies to be promoted in Victoria and the role of the State Government in promoting the preferred option);
- **Improving 'in-service' vehicle performance** (aims to reduce the level of vehicle emissions);
- **EcoDrive program** (partnership between local government and private sector to train and educate fleet managers);
- **TravelSmart**; and
- **Upgrade of 'Scats'** (upgrade of the computerised traffic control system which improves traffic flows).<sup>239</sup>

A number of programs contribute to achieving the *Victorian Greenhouse Strategy* through reduced greenhouse gas emissions, namely: initiatives contained in the Commonwealth Government's recent White Paper *Securing Australia's Energy Future*, developments in hydrogen fuel cell technology, buses used for public transport being powered by natural gas and the WA fuel cell bus technology trial.

## Notes

- <sup>1</sup> Professor P. Newman, *Transcript of Evidence*, 15 December 2003, p.502.
- <sup>2</sup> Davison, G. (2004) *Car Wars: How the car won our hearts and conquered our cities*, Allen & Unwin, Crows Nest, NSW, p. ix.
- <sup>3</sup> It is suggested in Williamson, T.J., Bennets, H. & Radford, A. (2003) *Understanding Sustainable Architecture*, Spon Press, London, p.14, that the world's population would reach a peak of 9 billion by 2070, with a population in decline by the end of this century. The world's population at the start of the 21<sup>st</sup> century was approximately 6 billion.
- <sup>4</sup> Thomas, R. (2003) 'Introduction' in Thomas, R & Fordham, M. (eds) (2003) *Sustainable Urban Design: An Environmental Approach*, Spon Press, London, p.3.
- <sup>5</sup> Gauzin-Müller, D. (2002) *Sustainable Architecture and Urbanism – Concepts, Technologies, Examples*, Birkhäuser, Basel, p.47.
- <sup>6</sup> Newman, P. & Kenworthy, J. (1999) *Sustainability and Cities: Overcoming Automobile Dependence*, Island Press, Washington, p.334.
- <sup>7</sup> Litman, T. (2000) 'An Economic Evaluation of Smart Growth & TDM: Social Welfare and Equity Impacts of Efforts to Reduce Sprawl and Automobile Dependency' *Victoria Transport Policy Institute*, p.6. Online publication See: [http://www.vtpti.org/s\\_growth.pdf](http://www.vtpti.org/s_growth.pdf)
- <sup>8</sup> Thomas, R. & Fordham, M. (eds) (2003) op. cit., p.31.
- <sup>9</sup> Brindle, R. (September 2003) *Kicking the habit (Part 1): some musings on the meaning of 'Car Dependence'*, *Road & Transport Research*, 12(3), p.71.
- <sup>10</sup> Mackett, R. L., & Ahern, A. (2000) cited in Brindle, R. (September 2003) op cit., p.71.
- <sup>11</sup> Stradling, S.C. (2002) cited in Brindle, R. (September 2003) op cit., p.71.
- <sup>12</sup> Brindle, R. (September 2003) op cit. p.63.
- <sup>13</sup> Ibid., p.64.
- <sup>14</sup> Ibid.
- <sup>15</sup> To support his point, Brindle (September 2003, op cit., p.71) suggests: "We need to focus on the available non-car choices that are being rejected by people. Even in dense, exciting old cities dripping with above-ground and below-ground group mass transit, like Paris and London, with congestion on a geographic and temporal scale that most of us would find alarming, still they drive".
- <sup>16</sup> Goodwin, D. (2001) cited in Brindle, September (2003) op cit., p.66.
- <sup>17</sup> Brindle, R. (September 2003) op cit., p.67.
- <sup>18</sup> The Village Project (2001) cited in Brindle, R. (September 2003) op cit., p.67.
- <sup>19</sup> Brindle, R. (September 2003), op cit., pp.71-72.
- <sup>20</sup> Brindle, R. (December 2003) 'Kicking the habit (Part 2): What are the real options for reducing Car Dependence?', *Road & Transport Research*, 12(4), p.35.
- <sup>21</sup> Auto Cities are cities which have been shaped by the motor vehicle and have thus become car dependent. In reference to the process, Newman notes: "beginning before the Second World War, but really accelerating after it, the automobile, supplemented by the bus, progressively became the transportation technology that shaped the city, particularly in North America and Australia. It became possible to develop in any direction...the Auto City was born" cited in Newman, P. & Kenworthy, J. (1999) op cit., p.31.
- <sup>22</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.334.
- <sup>23</sup> Clarke, P. (2003) 'Urban Planning & Design', in Thomas, R. & Fordham, M (eds) (2003) op. cit., p.14.
- <sup>24</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.335.
- <sup>25</sup> Ibid., pp.335-336.
- <sup>26</sup> Ibid., pp.336-339. The authors provide a comprehensive case study account of examples of global cities which have put in place programs and processes to reduce car dependency. They believe the best examples to be the European cities, especially Stockholm, Copenhagen, Zurich and Freiburg, followed by wealthy Asian cities of Singapore, Hong Kong and Tokyo, the Brazilian city of Curitiba and the Canadian cities of Toronto and Vancouver. The authors also identify the US cities of Boulder, Portland and Boston, as being active in tackling car dependency, through measures such as more compact housing, a focus on revitalizing the central and inner city areas and improved public transport systems.
- <sup>27</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.336.
- <sup>28</sup> Ibid.
- <sup>29</sup> Ibid., pp.336-337.
- <sup>30</sup> Brindle, R. (December 2003) op cit., pp.34-40.
- <sup>31</sup> Ibid., p.39.
- <sup>32</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.197.

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- <sup>33</sup> Ibid., p.144.
- <sup>34</sup> Ibid., p.339.
- <sup>35</sup> Clarke, P. (2003) in Thomas, R. & Fordham, M. (eds) (2003) op. cit., pp.15-16.
- <sup>36</sup> Ibid., p.26.
- <sup>37</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.26.
- <sup>38</sup> Pucher, J. & Renne, J. (2003) 'Socioeconomics of Urban Travel: Evidence from the 2001 National Household Travel Survey', *Transportation Quarterly*, 57(3), p.72.
- <sup>39</sup> Ibid., p.73.
- <sup>40</sup> Ibid.
- <sup>41</sup> Ibid.
- <sup>42</sup> VicHealth (April 2003) *Promoting Physical Activity*, Factsheet, VicHealth, p.1
- <sup>43</sup> Southworth, M. (1997) 'Walkable Suburbs? An Evaluation of Neotraditional Communities at the Urban Edge', *Journal of the American Planning Association*, 63(1), p.28.
- <sup>44</sup> Ibid., p.44.
- <sup>45</sup> Ibid.
- <sup>46</sup> Thomas, R. & Fordham, M. (eds) (2003) op. cit., p.31.
- <sup>47</sup> Gauzin-Müller, D. (2002) op cit., p.48.
- <sup>48</sup> English Partnerships, Housing Corporation & Urban Design Alliance, *Urban Design Compendium*, London. See: <http://www.rudi.net/whatson/desguides/udc/udcomp/shtml>
- <sup>49</sup> Ibid.
- <sup>50</sup> Litman, T. (June 2003) '*Reinventing Transportation: Exploring the Paradigm Shift Needed to Reconcile Transportation and Sustainability Objectives*', Victorian Transport Policy Institute, Victoria, British Columbia, p.6.
- <sup>51</sup> Ibid.
- <sup>52</sup> Ibid.
- <sup>53</sup> Ibid., p.i.
- <sup>54</sup> Litman, T. (November 2000) op. cit., p.i.
- <sup>55</sup> Ibid., p.1.
- <sup>56</sup> Ibid., p.16.
- <sup>57</sup> Ibid.
- <sup>58</sup> Thomas, R. 'Introduction' (2003) in Thomas, R. & Fordham, M. (ed) (2003) op. cit., p.3.
- <sup>59</sup> Tolley, R. for the Department of Infrastructure (July 2003) *Providing for Pedestrians: Principles and guidelines for improving pedestrian access to destinations and urban spaces*, Victorian Government Department of Infrastructure, Melbourne, p.31.
- <sup>60</sup> Ibid.
- <sup>61</sup> Pucher, J. & Renne, J. (2003) op cit., p.72.
- <sup>62</sup> Ibid., p.73.
- <sup>63</sup> Hillman, M. (1996) 'The future of public transport: the dangers of viewing policy through rose tinted spectacles', *World Transport Policy and Practice*, 2(3), p.24.
- <sup>64</sup> Ibid., p.24.
- <sup>65</sup> Ibid., p.27.
- <sup>66</sup> Ibid.
- <sup>67</sup> Gauzin-Müller, D. (2002) op. cit., p.47.
- <sup>68</sup> Thomas, R. & Fordham, M (eds) (2003) op. cit., p.27.
- <sup>69</sup> Ibid., p.30.
- <sup>70</sup> Ibid.
- <sup>71</sup> Luk, J. & Olszewski, P. (December 2003) 'Intregated public transport in Singapore and Hong Kong', *Road & Transport Research*, 12(4):42.
- <sup>72</sup> Ibid., pp.42-43.
- <sup>73</sup> Ibid., pp.42-43.
- <sup>74</sup> Ibid., p.49.
- <sup>75</sup> Gauzin-Müller, D. (2002) op. cit., p. 48.
- <sup>76</sup> See: <http://www.ferrytoll.org/>
- <sup>77</sup> See: <http://mapsvr.scag.ca.gov./parkride/>
- <sup>78</sup> See: [http://www.nationalbus.com.au/nat\\_park.html](http://www.nationalbus.com.au/nat_park.html)
- <sup>79</sup> Department of Sustainability and Environment *Melbourne in Fact 2001*, Victorian Government Department of Sustainability and Environment, Melbourne, p.15.
- <sup>80</sup> Ibid.
- <sup>81</sup> Australian Bureau of Statistics. (2003a) *Survey of Motor Vehicle Use*, Cat. No. 9208.0, ABS, Canberra, p.3.
- <sup>82</sup> Ibid., p.4.
- <sup>83</sup> Ibid.

<sup>84</sup> Ibid., p.11.

<sup>85</sup> Western Australian Department of Premier and Cabinet (September 2003) *Hope for the future: The Western Australian State Sustainability Strategy*, Government of Western Australia Department of Premier and Cabinet, Perth, p.183.

<sup>86</sup> Ibid., p.189.

<sup>87</sup> Australian Local Governance Association News (18 June 2004) *Special Edition – Energy White Paper*, p.1.

See: <http://www.alga.asn.au/news/Room/weeklyNews/200406/20040618.php>

<sup>88</sup> Ibid.

<sup>89</sup> Australian Conservation Foundation and Environment Victoria, *Submission to House of Representatives Standing Committee on Environment and Heritage*, Inquiry into Sustainable Cities, December 2003, p.2.

<sup>90</sup> Ibid.

<sup>91</sup> Western Australian Department of Premier and Cabinet (September 2003) op. cit., p.104.

<sup>92</sup> Ibid., p.105.

<sup>93</sup> Ibid.

<sup>94</sup> ABC Online (27 August 2004) 'The World Today – Solar energy used to create hydrogen fuel'. See: <http://www.abc.net.au/>

<sup>95</sup> Western Australian Department of Premier and Cabinet (September 2003) op. cit., p.106.

<sup>96</sup> Ibid.

<sup>97</sup> Ibid., p.185.

<sup>98</sup> For further detail see:

<http://www.sustainability.dpc.wa.gov.au/CaseStudies/Hydrogen%20Fuel%20Buses/Hydrogen%20Fuel%20Cell%20Buses.htm>

<sup>99</sup> Garrity, L. & WA Department of Planning and Infrastructure (January 2002) *Hydrogen Fuel Cell Buses: the future for sustainable transportation in Western Australia and around the world*, Government of Western Australia Department of Planning and Infrastructure, Perth.

See: <http://www.sustainability.dpc.wa.gov.au/CaseStudies/Hydrogen%20Fuel%20Buses/Hydrogen%20Fuel%20Cell%20Buses.htm>

<sup>100</sup> Ibid.

<sup>101</sup> Fisher, F. (2002) 'Widening the Definition of Environment for Responsible Urban Commuters', *Urban Policy and Research*, 20(3):309-312.

<sup>102</sup> Ibid., p.311.

<sup>103</sup> Transperth (April 1998) *Better Public Transport: Ten-Year Plan for Transperth 1998-2007*, Government of Western Australia Transperth, Perth, p.3.

<sup>104</sup> Western Australian Department of Premier and Cabinet (September 2003) op. cit., p.184.

<sup>105</sup> Transperth 'Transperth caring for the environment' online publication See:

<http://www.transperth.wa.gov.au>

<sup>106</sup> Mr M. Burgess, *Transcript of Evidence*, Perth, 16 December 2003, p.583.

<sup>107</sup> Department for Planning and Infrastructure, 'Perth Fuel Cell Bus Trial'. Online publication See: <http://www.dpi.wa.gov.au/fuelcells/>

<sup>108</sup> Mr. M. Burgess, *Transcript of Evidence*, Perth, 16 December 2003, p.591.

<sup>109</sup> Ibid., p.588.

<sup>110</sup> Mr. G. Merritt, *Transcript of Evidence*, Perth, 16 December 2003, p.589.

<sup>111</sup> Ibid., p.593.

<sup>112</sup> See:

<http://www.sustainability.dpc.wa.gov.au/CaseStudies/travelsmart/travelsmartprint.htm>

<sup>113</sup> Cregan, R, for the Department of Infrastructure (November 2003) *Promoting and Sustaining Council Involvement in TravelSmart*, Victorian Government Department of Infrastructure, p. 7. See: <http://www.travelsmart.vic.gov.au>

<sup>114</sup> Government of Western Australia, *The WA State Sustainability Strategy*, (September 2003) op cit., p.185.

<sup>115</sup> Mr. G. John, *Transcript of Evidence*, Perth, 15 December 2003, p.524.

<sup>116</sup> Ibid., p.526.

<sup>117</sup> Ibid.

<sup>118</sup> Ibid., p.527.

<sup>119</sup> Ibid., p.529.

<sup>120</sup> Western Australian Department of Premier and Cabinet (September 2003) op. cit., p.190.

<sup>121</sup> Cregan, R. (November 2003), op cit., p.5.

<sup>122</sup> Ibid.

<sup>123</sup> Ibid., p.3.

- <sup>124</sup> See: <http://ww.doi.vic.gov.au>
- <sup>125</sup> Ibid., p. 5.
- <sup>126</sup> See: <http://www.doi.vic.gov.au>
- <sup>127</sup> Western Australian Department of Premier and Cabinet (September 2003) op. cit., p.183.
- <sup>128</sup> Western Australian Planning Commission (June 2000a), *Liveable Neighbourhoods: Street Layout, Design and Traffic Management Guidelines*, Government of Western Australia Planning Commission, Perth, p.1.
- <sup>129</sup> Ibid., p.2.
- <sup>130</sup> Jones, E. (February 2001) *Liveable Neighbourhoods, Australia: Walking the 21<sup>st</sup> century – 20<sup>th</sup> to 22<sup>nd</sup> February 2001*, Government of Western Australia, WA Ministry for Planning, Perth, p.87.
- <sup>131</sup> Western Australian Planning Commission (June 2000a) op. cit., p.2.
- <sup>132</sup> Ibid.
- <sup>133</sup> Professor P. Newman, *Transcript of Evidence*, 15 December 2003, p.499.
- <sup>134</sup> Newman, P. & Kenworthy, J. (1999) op. cit., p.239. The authors record that patronage on the Perth rail system increased from 8 million passengers per year in 1991 to 30 million passengers per year in 1997. It is stated that this growth has been due to the replacement of the old diesel rail system with a fast electric service.
- <sup>135</sup> Cevero, R. (1995); Moriarty, P. (1994); & Royal Commission on Environmental Pollution (1994), cited in Moriarty, P. (1996) Can Urban Design Explain Personal Travel Levels?, *Urban Policy & Research*, 14(2), p.109.
- <sup>136</sup> Moriarty, P. (1996) op cit. p.109.
- <sup>137</sup> Newman, P. & Kenworthy, J. (1989) *Cities and Automobile Dependence: An International Sourcebook*, Gower, UK, cited in Moriarty, P. (1996) op cit., p.109.
- <sup>138</sup> Ibid.
- <sup>139</sup> Ibid.
- <sup>140</sup> Ibid.
- <sup>141</sup> Ibid., p.110.
- <sup>142</sup> Ibid., p.112.
- <sup>143</sup> Ibid., p.114.
- <sup>144</sup> Ibid.
- <sup>145</sup> Ibid.
- <sup>146</sup> Ibid., p.116.
- <sup>147</sup> Ibid.
- <sup>148</sup> See: <http://www.adelaidemetro.com.au/guides/obahn.html>
- <sup>149</sup> See: <http://ww.transport.qld.gov.au/busways/>
- <sup>150</sup> See: <http://www.transport.qld.gov.au/busways/>
- <sup>151</sup> Newman, P. (June 2001) *Ways busways fail*, Brisbane Institute. See: [www.brisinst.org.au/resources/newman\\_peter\\_busway.html](http://www.brisinst.org.au/resources/newman_peter_busway.html)
- <sup>152</sup> Department of Sustainability and Environment *Melbourne in Fact 2001*, Victorian Government Department of Sustainability and Environment, Melbourne, p.17.
- <sup>153</sup> Ibid.
- <sup>154</sup> Davison, G. (2004) op cit., p.259.
- <sup>155</sup> Ibid., p.261.
- <sup>156</sup> Ibid.
- <sup>157</sup> See: <http://www.dpc.vic.gov.au/ipc>
- <sup>158</sup> Ibid.
- <sup>159</sup> Ibid.
- <sup>160</sup> Tolley, R. for Department of Infrastructure (July 2003) op. cit., pp.23-24.
- <sup>161</sup> Ibid., p.35.
- <sup>162</sup> Ibid., p.34.
- <sup>163</sup> Ibid.
- <sup>164</sup> Ibid.
- <sup>165</sup> Ibid.
- <sup>166</sup> VicHealth (2003) *The Walking School Bus Program: Learnings from VicHealth's Pilot Program*, Victorian Government Victorian Health Promotion Foundation, Melbourne, p.3.
- <sup>167</sup> Ibid., p. 6.
- <sup>168</sup> Ibid., p. 3.
- <sup>169</sup> Ibid., p.37.
- <sup>170</sup> Ibid., p.38.
- <sup>171</sup> Ibid.
- <sup>172</sup> DSHA, *Submission number 2*, 12 February 2004, p.10.

- 173 See: <http://www.dse.vic.gov.au/melbourne2030online/>  
174 Ibid.
- 175 Shire of Yarra Ranges, *Submission number 29*, 15 March 2004, p.9.  
176 PIA (Vic), *Submission number 30*, 26 March 2004, pp.12-13.  
177 Ibid., p.13.  
178 PIA (Vic), *Submission number 30*, 26 March 2004, p.22.  
179 Mornington Peninsula Shire, *Submission number 10*, 16 February 2004, p.2.  
180 Ibid., p.3.  
181 Mr. T. Budge, *Transcript of Evidence*, September 2003, p.97.  
182 Ibid., p.91.  
183 Ms. R. Cousin, *Transcript of Evidence*, September 2003, p.96.  
184 Mr. S. Thorne, *Transcript of Evidence*, September 2003, p.70.  
185 PIA (Vic), *Submission number 30*, 26 March 2004, p.11.  
186 Ibid., pp. 12-13.  
187 Ibid.  
188 UDIA, *Submission number 33*, 31 March 2004, p.16.  
189 Ibid.  
190 Ibid., p.17.  
191 Ibid.  
192 Ibid.  
193 Ibid., pp.17-18.  
194 Mitchell Shire, *Submission number 19*, 23 February 2004, p.5.  
195 Ibid., p.9.  
196 The Age, '\$1bn merger deal for trains, trams', 19 February 2004, p.4.  
197 Municipal Association of Victoria Interface Councils Group, *Submission number 6*, 20 February 2004, p.4.  
198 Shire of Yarra Ranges, *Submission number 29*, 15 March 2004, p.4.  
199 Municipal Association of Victoria Interface Councils Group (2004) op cit., p.4.  
200 Ibid., p.13.  
201 Shire of Yarra Ranges, *Submission number 29*, 15 March 2004, p.4.  
202 Municipal Association of Victoria Interface Councils Group (2004) op cit., p.4.  
203 Ibid., p.13 and Shire of Yarra Ranges (2004) op cit., p.13.  
204 PTUA, *Submission number 10*, 16 February 2004, p.7.  
205 Ibid., p.8.  
206 These rail projects are:
- New line to Rowville
  - New line to East Doncaster
  - Extension of 75 tram to Knox
  - Electrify Broadmeadows to Craigieburn
  - Extend Epping line to South Morang
  - Continue electrification from Sydenham to Sunbury
  - Re-route Pakenham line through Fountain Gate Shopping Centre
  - New station and bus interchange at Southland Shopping Centre
  - Duplicate and electrify Frankston to Leawarra
  - Duplicate and electrify Leawarra to Mornington
  - Duplicate and electrify Sunshine to Melton
  - Duplicate single track sections on Hurstbridge line
  - Duplicate Upper Ferntree Gully to Belgrave
  - Duplicate Mooroolbark to Lilydale
  - Duplicate Dandenong to Cranbourne
  - New station at Eltham North (Allendale Road)
  - New station at Cave Hill (Mooroolbark Road)
  - New station and bus interchange at Hampton Park
  - New station and bus interchange at Newport West
  - Bus priority on major cross-regional routes.
- 207 PTUA, *Submission number 10*, 16 February 2004, pp. 10-11.  
208 Mr. C. Ellison, *Transcript of Evidence*, 5 April 2004, p.904.  
209 Dr. J. Scheurer, *Transcript of Evidence*, 13 October 2003, p.156.  
210 Mr. J. Stanley, *Transcript of Evidence*, September 2003, p.144.  
211 Ibid., pp.143-144.  
212 Mr. A. Parker, *Submission number 17*, 23 February 2004, p. 16.

- <sup>213</sup> Dr. P. Mees, *Transcript of Evidence*, 20 October 2003, p.185.
- <sup>214</sup> *Ibid.*, p.186.
- <sup>215</sup> *Ibid.*, p.187.
- <sup>216</sup> *Ibid.*, p.188.
- <sup>217</sup> *Ibid.*, p.189.
- <sup>218</sup> Mr. R. Kinnear, *Transcript of Evidence*, 29 September 2003, pp.117-118.
- <sup>219</sup> *Ibid.*, pp. 118-119.
- <sup>220</sup> *Ibid.*, p.121.
- <sup>221</sup> Mr. P. Harris, *Transcript of Evidence*, 29 September 2003, p.125.
- <sup>222</sup> See: [www.dse.vic.gov.au/melbourne2030online/](http://www.dse.vic.gov.au/melbourne2030online/)
- <sup>223</sup> Mr. S. Thorne, *Transcript of Evidence*, 15 September 2003, p.73.
- <sup>224</sup> Tolley, R. for Department of Infrastructure (July 2003) op. cit., pp.8-9.
- <sup>225</sup> PIA (Vic) (December 2002) *Planning for Health Benchmark Survey*, PIA (Vic), Melbourne, pp.3-4.
- <sup>226</sup> *Ibid.*
- <sup>227</sup> The designated 'growth areas' are: Casey-Cardinia (Cranbourne and Pakenham), Hume, Melton-Caroline Springs, Whittlesea (Plenty Valley and Epping North) and Wyndham (Werribee).
- <sup>228</sup> Victorian Department of Sustainability and Environment (November 2003) *Urban Development Program 2003 Report*, Victorian Government Department of Sustainability and Environment, Melbourne, p.1.
- <sup>229</sup> *Ibid.*, p.18.
- <sup>230</sup> *Ibid.*
- <sup>231</sup> Frankston City Council, *Submission number 18*, 23 February 2004, p.4.
- <sup>232</sup> The Transit Cities program being undertaken by DSE provides an example of a joint transport and land-use initiative. The program is not a part of the *Melbourne 2030 Strategy* but is a related project which will support *Melbourne 2030* by more efficient use of urban infrastructure ([www.dse.vic.gov.au/transitcities](http://www.dse.vic.gov.au/transitcities)). At present, there are 13 transit city sites, including Bendigo, Broadmeadows, Sydenham, Ballarat, Werribee, Geelong, Epping, Footscray, Box Hill, Ringwood, Dandenong, Frankston and Latrobe Valley. It is expected that the transit cities will provide best practice examples of urban design that could serve as a model for new developments.
- There are 5 main aims of the Transit Cities program, including:
- Integrating transport services and increasing public transport usage;
  - Providing opportunities for increased private investment and business innovation;
  - Encouraging sustainable development and improve the quality of a locality;
  - Developing high-density housing at strategic locations near transit centres; and
  - Building communities that offer fair access to services and employment opportunities.
- <sup>233</sup> *Ibid.*, pp.4-5.
- <sup>234</sup> National Greenhouse Gas Inventory data indicates that from 1990 to 1999 national transport emissions grew by 20%, the fastest growth of any sector. In 1999 transport contributed 16% of Australia's net greenhouse gas emissions.  
See: <http://www.greenhouse.gov.au/pubs/factsheets/mod5.html>
- <sup>235</sup> See: <http://www.greenhouse.gov.au/pubs/factsheets/mod5.html>
- <sup>236</sup> *Ibid.*
- <sup>237</sup> *Ibid.*
- <sup>238</sup> Department of Natural Resources and Environment (2002) *Victorian Greenhouse Strategy*, Victorian Government Department of Natural Resources and Environment, Melbourne, p.17.
- <sup>239</sup> *Ibid.*, pp.86-88.

