Submission to the Productivity Commission Inquiry into the Economic and Environmental Potential offered by Energy Efficiency

'More efficient energy use means a more resilient economy and a better environment'

Public Transport Users Association
November 2004

Contents

The PTUA acknowledges the contributions of Cameron Tampion, Peter Parker, Cathy McNaughton (Environment Victoria), David Wake (Conservation Council of WA), Anna Morton and Tony Morton in the production of this submission.
Overall production was coordinated by Cameron Tampion.

Introduction

The Public Transport Users Association (PTUA) welcomes the opportunity to contribute to the inquiry into the economic and environmental potential offered by energy efficiency. PTUA is the Victoria's recognised consumer organisation representing passengers of all forms of public transport. The PTUA is committed to:

- A sustainable economy
- A healthy ecology
- An equitable society.

Whilst Australia has made significant advances in labour productivity over the last 15 years compared to many other industrialised countries (Ahmad, Lequiller, Marianna, Pilat, Schreyer & Wölfl 2003), improvements to our energy productivity have proved more elusive. Since 1990, Australia has underperformed the OECD average in terms of energy use per capita and reductions in the ratio of energy use to GDP. Energy use per capita in Australia increased at a rate 23% above the OECD average from 1990 to 2000 (ABS 2004).

Having an economy so dependent on fossil fuels puts us at a disadvantage to our competitors, who use energy more efficiently than us. This is because we would be affected more than other countries should fuel prices rise for reasons such as supply shortfalls or carbon pricing mechanisms. Thus the inflationary effects on our economy would be more serious than in other countries, who by pursuing energy efficiency more actively than us, have made their domestic economies more resilient to energy price increases.

Even though Australia currently has significant energy reserves, it makes sense from both a national security and economic viewpoint to pursue energy efficiency with no less vigour than if we had none. We consider it important that our economy is made more resilient to energy price increases. For this to happen, Australia must seek to decouple economic growth from increases in energy usage. To achieve this, we believe that energy efficiency measures have a key role and make recommendations to this effect elsewhere in this paper.

Transport a priority

The disparity in efficiency between Australia and other countries is most serious in transport. The transport sector is both the largest single user of energy and one of the fastest growing, even off its already high base compared to other sectors (ABS 2004). This can be attributed to both the high per-capita car use in Australia (mainly due to limited public transport services) and the relatively poor efficiency performance of the Australian road vehicle fleet compared to the OECD average.

Even the United States, the traditional home of the gas guzzler, has improved motor vehicle efficiency from over 6 megajoules per vehicle kilometre (MJ/vkm) in the early 1970s to around 4.5 MJ/vkm in the late 1990s. By comparison, Australia's vehicle efficiency remained comparatively static over this period at a level similar to where the USA is now. Reflecting the higher incentives towards energy conservation in Western Europe, OECD Europe uses under 3.5 MJ/vkm (Lenzen, Dey & Hamilton 2003). It is also worth noting that transport energy is overwhelmingly obtained from

oil and that Australia's level of self-sufficiency in oil production is set to decline rapidly over the next decade (Petrie et al 2003).

Because (i) transport is a major and fast growing energy user and (ii) other countries with comparable living standards have better transport energy efficiency than us, some of the biggest gains in energy efficiency and emissions reductions could be attained by reducing the energy intensity of transport. Although we note the significant efficiency gains that could be achieved through increased investment in interstate and regional rail infrastructure and improvements to the rail access regime for freight, this submission concentrates on the benefits from and impediments to greater use of active[1] and public transport.

Why are vehicle emissions and energy consumption growing?

Despite improvements in fuel efficiency technology, total fuel use and vehicle emissions are climbing for two key reasons:

1. increases in average vehicle weight, engine power and use of air conditioning, and
2. vehicle kilometres travelled (VKT) growing at a rate twice that of population growth (NSW EPA 2003; BTRE 2003).

These points will be discussed one by one.

1. Vehicle weight, engine power and use of air conditioning

Gains in vehicle energy efficiency could be made if vehicles purchased today were more fuel efficient than those they replace. Possibly because our fuel prices have been lower than in European countries, Australian consumers have been less likely than their European counterparts to demand more fuel efficient vehicles.

A prime example of this is the growing popularity of four wheel drive vehicles. The lower fuel efficiency of these vehicles is contributing adversely to the average fuel efficiency of the Australian passenger car fleet. While such vehicles have a legitimate role in rural areas, their use by city dwellers is less justified. Even less excusable is that Australian taxpayers effectively subsidise these vehicles because they attract a lower import duty rate than conventional passenger cars. This perverse incentive should be removed, and replaced with a fairer regime that allows only genuine primary producers access to the lower tax rate.

Though hybrid cars are often suggested as a path to improved vehicle efficiency, the overall impact of this is negligible due to the poor economy of other cars on the road and the 20 years or more it will take to replace the entire fleet. Even if we immediately switched to efficient hybrid vehicles for half of all new car sales there would only be a mere two per cent reduction in oil consumption (Mushalik 2004).

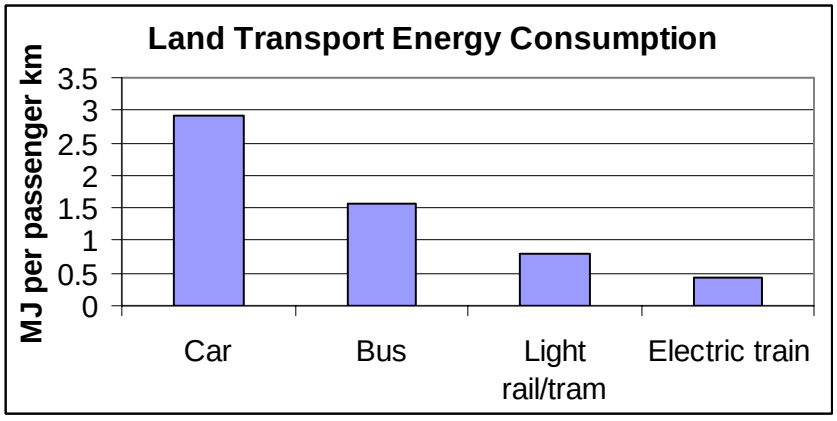
[1] Active transport comprises a range of non-motorised modes of transport including walking, cycling and wheelchairs. In many cases it is a complement to public transport, such as cycling to a railway station.

2. Growth in vehicle kilometres travelled per capita

We consider this is the most important reason for our poor transport energy efficiency performance, but which offers the best chance of progress. Because even if per-vehicle fuel efficiency was to improve, the slow rate of progress here is likely to be outweighed by the continued growth of vehicle kilometres travelled per capita (BTRE 2003). Far from advocating a technology-focussed solution to the growing impact of transport on the environment, the OECD has recognised that the majority of the effort to achieve environmentally sustainable transport must come from demand-side management (OECD 1999 cited in Institution of Engineers 1999). In other words we cannot rely on cleaner cars alone - the amount of travel must also be reduced. Improvements in individual vehicle efficiency have a secondary role compared to improving the systemic efficiency of transport in Australia.

Private motor vehicles are the most energy intensive means of land transport (see Chart 1), so it should not be surprising that Australia's increasingly high level of car usage would result in above average and growing levels of energy use and vehicle pollution (including greenhouse emissions). On one hand Australia is regarded as a large and empty country necessitating high levels of car use, but "[c]ontrary to the myth that Australia's transportation emissions are high because of the large distances separating major urban centres, most of Australia's passenger transportation occurs within, rather than between, urban centres (around 72 per cent of total car travel occurs in urban centres, and only 5.5 per cent is for interstate travel)" (Turton 2004, p. viii).

Chart 1:



Source: Newman 2000

Since cars are highly energy intensive and improvements in new car fuel efficiency would take a long time to significantly reduce total fleet consumption, shifting journeys onto more efficient modes is the most effective means of increasing transport energy efficiency. Shifting journeys from car to public transport would not only reduce the number of passenger kilometres undertaken in relatively inefficient vehicles, it would increase the load factors of public transport vehicles and thus compound the efficiency gains when expressed in passenger kilometres per megajoule. Our transport policies should therefore seek to reverse growth in private car use and encourage use of other modes such as walking, cycling and public transport.

A significant shift from cars to more efficient modes is not an unrealistic goal. A quick reversal in the recent shift towards car use (see tables 1 and 2) would lay the foundation for longer-term improvements.

Table 1: Journeys to school – Adelaide

	1981	1997
Car	24%	60%
Cycle	14%	5%
Walk	42%	21%

Source: Parker 2001

Table 2: Journeys to work and study – National

	1996	2000
Car, truck, van	75%	81%
Cycle	2%	1%
Walk	6%	4%
Train	8%	7%
Bus	6%	4%
Other	3%	2%

Source: ABS 2004

Research in Western Australia has demonstrated the potential for a dramatic shift in transport mode choice (Socialdata Australia 2000), although this potential is influenced by the level of public transport services in the area.

Making the shift – cars to walking, cycling and public transport

For the most part transport is a means to an end rather than an end in itself. Commuters will tend to choose the transport mode or combination of modes that is most efficient for them in terms of cost, time and effort (both mental and physical effort). A person making decisions based on their own best interests will not tend to consider the marginal costs to society in the form of congestion, pollution, road accidents, reduced physical activity, etcetera when selecting their means of travel (or whether to travel at all). As a consequence, sub-optimal outcomes at the macro level result from the rational choices of individuals. The impact of transport choice is a classic case of negative externalities harming the environment, health and the economy, or “The Tragedy of the Commons”.

This is particularly true when choice is restricted because the more energy-efficient 'options' are either unavailable or poorly developed, as is currently the case with public transport services in many areas. Because the consumer is merely making a rational decision based on the attractiveness of choices available in their area, it

follows that energy efficiency policy must include measures to make use of 'green' transport modes more attractive relative to more energy intensive modes.

Despite the many advantages of public transport in terms of safety, environmental impact, parking and total cost of ownership, only about 16% of capital city residents use public transport on a typical weekday (ABS 2000). The most common reasons given for not using public transport are the lack of services in the area and the length of travel times. This is consistent with the findings of a report prepared for the Victorian Department of Infrastructure that shows commuters are willing to make the switch from cars to public transport where the services are:

- extensive in coverage
- frequent
- reliable
- well publicised, and
- well integrated.

(Booz, Allen & Hamilton, 2001)

The success of such a strategy is demonstrated by comparing the public transport systems of Melbourne in Australia and Toronto and Vancouver in Canada. These cities are comparable in terms of population size and density and level of affluence.

Despite North America's very low petrol prices and Melbourne having a climate that is arguably more favourable to active and public transport, the Canadian cities achieve dramatically higher levels of public transport patronage and cost recovery by offering frequent, fast and affordable services. The typical Toronto suburban bus route runs approximately every 10 minutes from early morning to late evening, seven days a week, so passengers scarcely need to consult a timetable. Even though Toronto has less fixed rail infrastructure than Australian cities, patronage is higher because public transport can offer a 'go anywhere anytime' capability due to the direct and frequent services offered.

Melbourne public transport is only as good as its least frequent feeder bus, and this can be very poor indeed. The average bus route runs approximately every 40 minutes, finishing before 7pm, and not at all on Sundays. While shopping centre car parks overflow on Sundays hundreds of buses sit idle in depots. When buses do run, routes can be very indirect, with walking often being faster. Safe bike routes to public transport are also often lacking and car parks at Melbourne railway stations outnumber bicycle lockers by nearly 50 to 1. Thus if you don't live near a railway station or tram stop, the car in the garage represents the most rational transport choice for most, despite all the costs and negative externalities.

The story of public transport not meeting modern travel needs is similar in most other Australian cities. Sydney offers a confusing mixture of unintegrated government and private services that often require passengers to pay two or three fares. Brisbane has made progress with its fare system but has not yet integrated its buses and trains, while Adelaide's diesel trains are slow and infrequent and its sole remaining tram line finishes short of the railway station.

Only Perth has made significant transport progress, with new rail lines, new stations and some improved bus services. Despite its reputation for car-dependence and

abundant parking, patronage is rising steadily, showing that households do use quality public transport, even if they have two or more cars.

Other cities have also shown that public transport does not need to be a mode of last resort, used only by the young, poor and old. High usage rates of Chicago's commuter rail services among high income people (that are typically expected to favour private cars) were also attributed to the reputation for clean, punctual trains and attention to customer needs (Weyrich & Lind 1996).

Closer to home, patronage on the Sandringham rail line serving Melbourne's affluent bayside suburbs increased by 33% after service frequency was increased in the early 1990s, with fare revenue increasing by 40% as a greater proportion of full fare paying passengers opted to use the system (PTUA 2002).

Elsewhere in Australia, the experience of Sydney during the Olympics mirrored that of Barcelona in 1992 whereby the temporary provision of significantly enhanced public transport services encouraged a shift in travel modes, albeit short-lived, that reduced road traffic congestion and travel times on key arterial routes (Hensher & Brewer 2001).

Improved service does not necessarily cost a lot of money or require extensive new infrastructure. Indeed the opportunities are especially great when better use is made of the existing fleet by redesigning routes and increasing off-peak service frequencies to a level attractive enough for those with a choice to use (PTUA 2002; Regan 2004).

Travel Smart programs marketing transport alternatives to the car in Perth and Melbourne have achieved significant reductions in driving (10-15% less) and substantial increases in trips made by public transport (27% more), walking trips (26% more) and cycling (26%). TravelSmart marketing can be even more influential in changing travel choices when combined with improvements to public transport and walking and cycling facilities.

The message is clear: people will use public transport if it is available and of high standard, but people who have a choice will abandon sub-standard public transport in favour of their car. For reasons explained in the next section, current policies have given too few people the choice, and thus we continue to use energy wastefully.

Do current policies reflect what's needed?

Investment in public transport infrastructure has suffered from institutional neglect for a number of decades, especially at the federal level (James 2003; MTF 2004). This is reflected in the rail sector coming equal last with a D- rating in a report card on the status of Australia's infrastructure (www.infrastructurereportcard.org.au 2001).

By contrast, national and state roads were rated at about the average for all sectors. Local roads were ranked slightly below average - in between major roads and rail.

As is proving to be a common theme, many existing policies encourage energy consumption and discourage conservation. A prime example is commonwealth support for urban freeways.

Freeway proponents claim that new roads increase average speeds, thus improving traffic flow and increasing average fuel economy per kilometre travelled. The problem here is that any improvement is swamped by the increased demand for car travel that freeways generate. Because this demand is over and above what was carried on existing roads, freeways encourage more drivers to drive further, and thus increase traffic levels, energy use and car dependence (PTUA 2002). They also tend to reduce patronage on nearby public transport services, tending to increase the latter's operating loss (Zeibots 2003). Since freeways entrench high fuel use patterns and this is counterproductive to saving energy, federal funding for them should be curtailed. Instead resources should be diverted to non-car transport modes, which will tend to benefit both non-motorists and motorists, due to fewer cars needing to be on the road.

There are also many no or low cost improvements that can be made as well. It makes no sense to continue to build suburbs that have street layouts that are unsuitable for anything but the private car. Instead new subdivisions should provide sensible street layouts for efficient direct bus routes, and have permeable easily crossed local grid streets so residents can walk or cycle to neighbourhood facilities. Minimum parking regulations should be abolished and developers encouraged to build new suburbs along existing rail corridors. There is also much scope for improvements in existing suburbs, with local projects such as better access between train and bus and improved pedestrian access facilities being obvious needs. Urban planning which consolidates mixed use development (trip generators and destinations) reduces separate dispersed car trips and creates a supporting environment for public transport, walking and cycling. There is also evidence that more compact and travel-efficient urban forms reduce road trauma (Ewing, Schieber & Zegeer 2003).

Institutional regulations that favour cars over public transport should be abolished. Salary packaging arrangements should be neutral with regards to choice of transport, with equal benefits to those who choose to use public transport rather than a motor vehicle. FBT arrangements that reward increased travel should be abolished, as should be differential fuel allowances that pay more to drivers of larger cars. Employees should be allowed to 'cash-in' parking entitlements without suffering a tax penalty. Given that public transport users face regular CPI-based fare increases, it is only fair that motorists pay similarly through the restoration of automatic CPI indexation of fuel excise.

Governments at all levels clearly need to increase their commitment to walking, cycling and public transport, especially rail. The good news is that total transport expenditure can remain unchanged, or even decrease, if resources are shifted from urban freeways, which reduce rather than increase systemic energy efficiency.

Economic Benefits from reduced car dependence

Greater energy security and improved trade balance

The Commonwealth Treasurer recently highlighted the risk to the economy from the recent surge in global oil prices.

> "... I think there are big risks out there, the biggest of which ... is oil now through $US53 a barrel.

> "If that were to continue for a long period of time - sure we could handle it for three months or six months - but if that were to continue for 12 months or 18 months, that could have a very material effect on global growth it could have a very material effect on Australian growth and that is a very looming challenge over the next three to four years."
> (Costello 2004)

Despite Australia's position as a net exporter of energy and its relatively high petroleum self-sufficiency (currently around 80%), Australia would appear to be no less vulnerable to an oil shock than the European Union given the higher oil intensity of the Australian economy. Estimates of the impact of a $10 per barrel increase in the price of crude oil range from a 0.3% reduction in GDP growth not counting the impact on trading partners (ANZ 2004) to 0.9% reduction (Ciscar, Russ, Parousos & Stroblos 2004). A $30 per barrel increase could see as much as 2.53% wiped off GDP (Ciscar et al).

The currently high level of oil self-sufficiency relative to other OECD countries is not expected to last with Geoscience Australia estimating an 11-year life span for Australia's economic demonstrated resources at the current rate of consumption (Petrie & others 2003).

According to the Australian Petroleum Production & Exploration Association (APPEA):

> "[Australia] is running out of crude oil and we have a greenhouse problem. We ought to be doing something about cutting [oil] demand…"
> APPEA executive director Barry Jones quoted in AFR, 25 October 2004

Similarly the International Energy Agency (IEA) is suggesting that the current high price of oil may be a blessing in disguise if it helps us to "become more aware of the scarcity of oil resources" and provides "new momentum towards efficiency gains, fuel diversification and energy savings in general" (Halff 2004).

APPEA is projecting an oil self-sufficiency level for Australia of only 22% in a decade (about a quarter of our current level) with a daily import bill of $24 million based on $30 per barrel (APPEA 2004). Given this level of self-sufficiency and the moderate nature of the price used to arrive at this figure, the impact on Australia's balance of trade could conceivably be at least $40 million per day (over $14 billion p.a.) at the current prevailing price or $128 million per day (nearly $50 billion p.a.) if prices return to the same real levels seen after the 1970's oil shocks (based on $160 per barrel postulated in Verleger 2004). Other estimates assuming a relatively low oil price of US$20 per barrel suggest a trade deficit in liquid hydrocarbons of over $7.6 billion p.a. by 2010 (Akehurst 2002).

Proposals to increase self-sufficiency from the supply side frequently include substantial subsidies and tax concessions to the oil industry from Australian taxpayers to make less economic fields more commercially attractive (e.g. APPEA 2004). Such approaches do nothing to reduce greenhouse emissions or increase energy efficiency and are at odds with the principle of technology neutrality that underlies much of the government's energy policy.

Whilst some of the recent surge in oil prices can be attributed to temporary supply bottlenecks (e.g. instability in Nigeria, Iraq and Venezuela and the break-up of Russia's Yukos), there is strong evidence of a fundamental shift in the supply and demand balance and peaking of production from the world's major oil reserves in the Middle East and Gulf of Mexico as well as Australia's Bass Strait (Bakhtiari 2004; Robinson 2004; Mushalik 2004). The growth in oil consumption in China and India is outpacing many analysts' earlier predictions, global oil production has failed to keep up and several producers (e.g. Royal Dutch Shell) have revised downwards their estimated reserves. Furthermore, by far the largest reserves are located within the politically volatile Middle East region (BP 2004) which increases the risk of future supply bottlenecks and price volatility. There are also signs that OPEC wishes to target a price range closer to the recent historical highs which may put a floor under any downwards movements (Bahree 2004). Whilst we can expect renewed effort in oil exploration and development following the recent surge in oil prices, it would be an optimist that would suggest all new discoveries will be as sizable and easily and cheaply exploitable as the major existing developed fields (Campbell & Laherrere 1998). Many new fields will only be economically exploitable if oil prices remain near or surpass what are historically high levels in nominal terms.

> *"... it doesn't really matter if it turns out that our forecasts about the rate at which the changes will take place are unduly pessimistic. The magnitude of the adjustments we shall have to make is so great that we need all the time we can get."*
>
> (Green 1999)

A prudent approach to managing this substantial risk to the Australian economy would be to reduce the oil intensity of the Australian economy, especially where so many other positive benefits of doing so exist as outlined in this paper. It is notable that reduced oil intensity since the early 1970's is largely responsible for the current resilience of the global economy compared to the effects of the oil shocks of the 1970s (Dickman & Holloway 2004). Significant risks will remain, however, until oil intensity is significantly reduced below current levels. In effect, increasing the productivity of Australia's energy consumption through reduced oil and car dependence is a no regrets measure.

The Hydrogen Economy

Various sectors, particularly in the USA, are promoting hydrogen as a miracle fuel to replace oil. Whilst fuel cell technology has some advantages (e.g. reduced localised urban air pollution compared to conventional cars), many proponents of the "hydrogen economy" underplay the complications inherent in hydrogen production and distribution (Harrison 2004).

Hydrogen is better classified as a means of energy storage rather than a primary energy source. Almost all of the world's current production of hydrogen is sourced from finite fossil fuel, such as coal gasification and reforming of natural gas (ACIL Tasman & Parsons Brinckerhoff 2003). Other likely sources of hydrogen include costly and inefficient techniques such as the electrolysis of water which will itself require significant inputs of electricity, frequently generated from fossil fuel (ACIL

Tasman & Parsons Brinckerhoff 2003; Romm 2004; Harrison 2004). Many options involve substantial conversion inefficiencies and transmission losses. Given the questions that are currently being raised about Australia's greenhouse emissions and the capacity of Australia's generation and distribution infrastructure to meet peak demand, a major new use for electricity is unlikely to be universally welcomed.

Energy analysts do not project hydrogen powered cars to become prevalent until around the middle of the century (Hook 2001) by which time the world's oil supplies may have been exhausted for most practical purposes (BP 2004), and almost certainly substantially more expensive (Campbell & Laherrere 1998).

Even if the so-called hydrogen economy is successful in freeing motorists from oil dependency, a raft of other negative externalities remain, including increasing congestion, unproductive use of land for parking, access and equity issues, and death and injury from traffic accidents.

Transport affordability, accessibility and equity

Transport is one of the largest components of household expenditure with an average household spending around 16% of its income on transport whilst many low income households spend around one quarter of their income on transport (Warman 2001; ABS 2002c). Transport costs are particularly high in outer suburban areas where public transport services are poor and car dependence is high. On average, this increased level of car dependence in outer suburbs results in each household requiring one extra car (Warman 2001). The USA and Australia have both the highest levels of car dependence in the OECD and dedicate the highest proportion of income to transport (Newman 2000), despite our relatively low fuel prices.

Each new car costs its household over $100 per week, with a typical medium car costing around $170 per week to own and operate (RACV 2004). Over three quarters of this cost relates to fixed standing costs that do not vary significantly with usage such as depreciation, registration, insurance and interest. Despite often-vocal protests about petrol prices, only about 15% of the total cost of ownership relates to fuel.

The ability to avoid the costs of an additional car would enable a household to:

- "accumulate an additional $750,000 ([2001] dollars) in superannuation over their working life;
- retire at 55 years, instead of 65 years, whilst still accumulating an additional $370,000 in retirement funds;
- afford to borrow an additional $80,000 for housing based on a 25 year loan; or
- purchase an average priced Melbourne home over 12 years instead of 25 years."
  (Warman 2001)

A comparison between an additional car and public transport costs for a typical family in Melbourne could resemble the following:

Table 3: Comparison of coast of an additional car vs. public transport ($/week)

Additional car (average medium car):				**Public transport for one parent and 2 children:**	
Price of petrol per litre	***90.1c***	***$3.00***	***$10.00***		
Standing costs	$130	$130	$130	1 x zones 123 adult weekly ticket	$52
Operating costs	$40	$102	$308	2 x zones 123 concession weekly tickets	$48
Total costs:	$170	$232	$438	Total fares:	$100

Sources: RACV 2004; Metlink 2004; author's calculations

Note: RACV car operating costs based on average for medium cars and 90.1c/L for petrol. As alluded to in the discussion above, there is strong potential for oil prices to maintain their upward trend of recent years, notwithstanding short-term easing in prices as current bottlenecks are resolved. Some analysts predict prices of $3/L in the medium term and $10/L sometime after that (e.g. Bakhtiari 2004).

In reality it is unlikely that all family member will require a ticket for all three metropolitan public transport zones (saving an additional $10-35 per week on the adult ticket alone), and the family could derive greater value by purchasing monthly or yearly tickets. Notwithstanding this likely overstatement of public transport costs and the relatively low petrol price assumed for car running costs, a family such as this could save over $70 per week by switching from car use to public transport supplemented by walking and cycling to local destinations.

On top of the obvious benefit to the individual household, these savings represent expenditure that is not going to foreign-owned automotive and (largely) foreign-owned petroleum companies, but instead is available for expenditure on other items with higher local content and greater economic multipliers (Warman 2001).

Whilst theoretically attractive, the above analysis of the relative costs of car and public transport omits two key variables: the age of the car and the quality of public transport. As discussed elsewhere, people will abandon sub-standard public transport in favour of their car, and public transport in many outer suburban areas is of very poor standard. For many people it is not so much a matter of comfort and travel time as much as it is a complete lack of services in their area, particularly outside weekday business hours (PTUA 2002).

The total cost of ownership for used cars may also be lower than indicated above due to lower standing costs, however operating costs may be higher due to inferior reliability and technology. The competitive position of public transport may be somewhat weaker than the above analysis suggests when compared to such vehicles, especially when the many externalities arising from the use of motor cars are not incorporated into decision making. For people to consider making the shift to public transport not only must the service be of good standard, the cost structure must be competitive. This latter goal can be achieved by:

1. ensuring public transport fares are integrated across public transport modes and are kept low for both frequent and occasional users, and
2. internalising the external costs of motoring into the actual costs paid by motorists through vehicle and fuel taxation and road user pricing.

Whilst low income households spend a greater proportion of their income on transport, the wealthiest 20% of households spend about three times as much in dollar terms as the bottom 20% (ABS 2002b). Recent research in the United Kingdom has found that "petrol taxes are not regressive in aggregate because poorer households are less likely to have a car" (Policy Studies Institute 2004, p. 7). A similar pattern of

lower car ownership among low income groups is also apparent in Australia with an overwhelming majority of households in disadvantaged areas owning no more than one car and about 20% not owning a car at all (ABS 2002c). With this in mind, it seems many assertions that petrol taxes are regressive are probably overdone and that road funding biases government expenditure towards higher income groups. An interesting comparison is tobacco (of which tax represents around three quarters of the retail price) where the poorest 20% of households spend about the same in dollar terms as the top 20% and a much greater proportion of their total income, demonstrating the existence of other taxes designed to discourage consumption that are much more regressive than fuel excise (ABS 2002b; VicHealth Centre for Tobacco Control 2004).

The two most common reasons for using public transport are not owning a car (34%) and cost (29%), reflecting on one hand the importance of public transport in our urban areas as a cost-effective means of mobility, but on the other hand its current low status among upper income groups with the capacity to choose other modes (ABS 2000). A large-scale shift from private cars to public transport, bringing the economic and environmental benefits outlined elsewhere in this paper, is only likely if substantial investment is made in the extent and quality of public transport in both low income areas, giving low income households the genuine option of avoiding the costs of vehicle ownership, and in high income areas such that high income households have an attractive alternative to the motor car.

Even prior to the recent surge in oil prices, the cost of transport represented a significant disincentive to many people seeking work (Hulse & Randolph 2004). Although unemployment costs the Australian economy tens of billions of dollars each year (Quiggin 1995), many unemployed people report that the cost of transport makes some employment options uneconomic compared to remaining on benefits. Yet the longer a person is unemployed the less attractive they are to employers, so it is desirable that they accept available work to gain experience and possible promotion. For many such people, the fixed costs of motoring such as the financing and/or opportunity cost of purchasing a car, vehicle registration and insurance make car ownership an expensive and often unattainable luxury. For people in this situation, the theoretical regressive nature of fuel excise (AAA 2001) is an academic hypothesis that is swamped by the upfront costs of mobility. The problem is particularly acute for young people who tend to work nights and weekends in hospitality, retail and catering jobs in suburban shopping centres remote from frequent public transport services. The provision of adequate and accessible public transport options would go a long way towards providing affordable mobility, eliminating social and economic exclusion and reducing the enormous fiscal and social cost of unemployment (e.g. Colvin 2002).

Older people are also affected. Despite Australia's high rate of car ownership, more than 40% of sole person households aged 65 years or older do not own a car (Department of Health & Aging 2002), suggesting a high disparity in access to private motorised transport. Within this group is also a significant proportion that cannot drive due to an impairment, but would still be able to participate in society given accessible public transport services. This constraint will increase in significance as the population ages.

The relationship between roads and economic growth

Despite the long accepted mantra that roads are good for the economy and employment, the association appears unsupported by evidence and ambiguous at best.

Whitelegg (1994) could not demonstrate any positive connection between roads, jobs and the economy, the UK Standing Advisory Committee on Trunk Road Assessment found no discernible effect on economic growth from road building whilst leaving open the possibility of negative economic impacts (SACTRA 1999), and a 1997 study for the World Bank found a negative correlation between car use and per capita income in high income economies (Kenworthy, Laube, Newman & Barter 1997). Similarly a study into the likely impacts of the Scoresby Freeway in Melbourne found that the benefits from building the freeway would be exceeded by shifting just 2 per cent of car trips onto public transport (Sinclair Knight Merz 1997).

Much of the theoretical benefit from road building is a reduction in traffic congestion allowing shorter travel times and lower fuel consumption. In reality a wide body of research from around the world has demonstrated that time and fuel savings are frequently over-estimated since additional road capacity quickly induces further demand and congestion returns to the levels that existed prior to the addition of new road capacity (SACTRA 1994; Institution of Engineers 1990; Pfleiderer & Dieterich 1995; Luk & Chung 1997). Thus new roads not only fail to reduce congestion and fuel consumption, they also encourage a modal shift to cars from more efficient and sustainable modes such as rail, generate more and longer journeys, create more congestion on feeder roads and encourage car dependent land use patterns (Litman 2001; Zeibots 2003; Kenworthy 2003; Myer 2004).

This phenomenon of induced demand is recognised and incorporated into the business plans of private sector infrastructure providers such as the ConnectEast consortium who have contracted to build and operate Melbourne's Mitcham-Frankston Freeway (Davidson 2004).

A study by the OECD found that “[a]s soon as new road space becomes available in large cities, it is quickly filled.”. “While congestion might spread in cities which make little or no attempt to increase road capacity in line with demand, such cities will not "grind to a halt". People and firms adapt. Travellers change either mode or destination” (OECD 1995).

Governments should recognise that in major cities no amount of road building will satisfy demand, particularly in peak times. Even if it did, this capital expenditure would be inefficient because the extra capacity would only be used for a few hours each day.

In contrast, investment in public transport would extend affordable transport choice to all, make us less vulnerable to energy price hikes, reduce the need to spend on new roads and have many other social, health and environmental benefits.

“They paved paradise and put up a parking lot” (Mitchell 1970)

Providing for cars takes up around one third of our urban areas (Bargwanna & Mason 2001). Due to the multitude of places that space is provided for cars (e.g. parking

spaces at home, work and shopping centres that lie idle much of the time), a typical family car requires about three times more space than a typical family home (Engwicht 1992). To carry 50,000 people per hour in each direction by car, a road would need to be 20 times wider than a railway with the same capacity (UITP 2001). A pedestrian requires 0.8m^2 of footpath, a cyclist 2m^2 of pavement and a car travelling at walking speed requires 20m^2 of road. At 40km/h a car's space requirement triples to 60m^2 (Tolley 2003; Bargwanna & Mason 2001). Furthermore, run-off from roads and parking areas pollutes our waterways with oil and particles from tyres and brake pads.

The value of land under roads was estimated at around $100-120 billion in 1996 (NIEIR 1996). Adjusting these figures for inflation suggests a current value in the range $120-145 billion which is roughly equivalent to the total assets reported in the Commonwealth government's financial statements. Indexation in line with house prices would suggest a land value around $222-267 billion. A figure closer to those obtained by indexing in line with house prices (as opposed to CPI) is supported by subsequent research that valued the land provided for cars in Sydney alone at over $90 billion (Banfield, Hutabarat & Diesendorf 1999). Based on these values and a required rate of return of 5%, road users should now be paying between $6 billion and $13 billion p.a. for the use of this land.

Whilst low urban density is not necessarily a barrier to a public transport system that is competitive with private motor cars (Mees 2000; PTUA 2002), sprawling suburbs with infrastructure focussed on individual motorised transport and poor access to local amenities are strongly correlated with high transport energy use (Kenworthy *et al* 1997; Perkins 2003).

Reducing the extent to which this land is made available for free to motorists in the form of high capacity roads and parking, combined with increased provision for public transport and balanced urban consolidation practices, could encourage more rational use of this land and reduce the amount of energy consumed by transport.

A broader concept of capital

After decades of largely viewing capital in terms of physical infrastructure, economists and policy makers are increasingly recognising the value of social capital in creating resilient communities and facilitating economic performance (OECD 2001; Allen Consulting Group 2002; ABS 2002a; Productivity Commission 2003).

International research also points to lower levels of social connectedness and civic involvement in car-dependent communities (Mumford 1966; Appleyard 1981; Engwicht 1992; PTUA 2002; Leyden 2003). It should come as no surprise therefore that the OECD's most car dependent members (Australia and the USA) show among the clearest declines in social capital, whilst results are mixed among other member countries (OECD 2001). Downward trends in social capital should be of major concern to policy makers and the goal of reversing this decline should be built into the plethora of policy areas impacting social capital including transport, town planning and land use policy.

Trends in human capital also reflect performance in other determinants of international competitiveness in the global information economy. Cities that are

cleaner, with lower air and noise pollution, safer and healthier are better able to compete for the world's high income knowledge workers, major events, symposiums and commercial opportunities (Allen Consulting Group 2002).

The provision of effective public transport services is now seen as a key contributor to the economic success of cities by aiding mobility without causing the social and physical fragmentation inherent in car-based approaches. Furthermore, such services can be provided at a fraction of the cost of infrastructure that is geared towards large-scale private car usage. For example, the city-state of Singapore was able to cancel the construction of $500 million in road projects by encouraging a shift away from private car use (Hook 2001), whilst a revitalisation of Victoria's urban and regional public transport system has been costed at under a third the cost of comparable infrastructure focussed on private car usage (PTUA 2002). Provision for non-motorised modes of transport could be provided even more cheaply and often designed into other infrastructure projects with little incremental cost.

Better health outcomes

Road trauma

Traffic accidents kill nearly 2,000 Australians each year whilst over 20,000 are hospitalised due to road crashes (ABS 2001). The human cost of these accidents (i.e. not counting property damage, traffic delays, etc) is in excess of $8 billion p.a. (BTRE 2000). Whilst Australia's fatality rate of 12.2 per 100,000 population compares favourably with the OECD average, this comprises a relatively low fatality rate among car occupants and a relatively high rate of pedestrian and cyclist injuries resulting from car crashes (ATSB 2000; Parker 2001). It is also likely that official statistics understate the real level of hospitalisations resulting from car-bicycle crashes due to reporting issues (Standing Committee on Transport and Regional Services 2004). This disparity in Australia's cross-modal safety performance highlights the lack of provision for active transport modes relative to cars. Countries that have prioritised the provision of safe cycle lanes and paths experience a much lower level of deaths and injuries among cyclists (Parker 2001). Australia, on the other hand, has experienced a vicious circle whereby perceptions of poor safety for cyclists and pedestrians have fuelled increased car use and traffic, which has in turn heightened safety fears for cyclists and pedestrians, further driving growth in car use and traffic.

The recent Inquiry into National Road Safety (2004) found that a reduction in road trauma could be achieved by providing alternatives to private motor vehicle trips. Whilst laudable, this goal will require substantial commitment to making non-motorised transport a safe option through measures such as:

- generous footpaths and crossings,
- generous and uninterrupted cycle lanes and paths,
- widespread traffic calming measures,
- supporting programs that encourage active transport such as walking school buses and provision for secure cycle parking at railway stations and places of work and education, and
- urban planning practices that facilitate active transport modes and easy access to rapid transit services. Urban sprawl has been linked to higher levels of

fatalities for both vehicle occupants and pedestrians (e.g. Ewing, Schieber, & Zegeer 2003).

Indirect health costs

On top of direct health consequences such as road trauma, a society centred around private motor vehicles suffers many indirect health costs. Urban sprawl is strongly correlated with a range of ailments including obesity, heart disease and respiratory problems (e.g. Ewing, Schmid, Killingsworth, Zlot & Raudenbush 2003; Sturm & Cohen 2004). Some health economists are now suggesting that lifestyle-related illnesses of young and middle aged Australians present a greater fiscal challenge than the aging population (Allen 2004). Furthermore, projections of future health care expenditure in the context of an aging population are quite sensitive to assumptions about non-demographic factors such as the increasing prevalence of obesity (Productivity Commission 2004b). The incidence and severity of these ailments can be influenced by physical activity, and their impact can be expected to be reduced in a society that encourages more active and less polluting modes of transport. Urban areas that are conducive to physical activity are synonymous with urban areas that are pedestrian and cyclist-friendly, with good access to public transport (Tolley 2003; Saelens, Sallis, Black & Chen 2003).

Table 4 summarises the costs of a number of illnesses associated with car dependency. Further information on each is included at Appendix A.

Table 4: Cost of selected ailments influenced by transport and activity patterns

Ailment	**Annual cost**
Obesity	1.5 billion
Diabetes	3 billion
Heart disease	3.9 billion
Respiratory disease	18 billion
Cancer	0.5 billion
Arthritis	9 billion
Osteoporosis	2 billion
Dementia	6.6 billion
Depression	15.5 billion
Total	**$60 billion**

Sources: various, see Appendix A.

> *"Cars make us sick, sad and dead - how cars are managed is critical to public health – and much more important than we previously realised – we need to repopulate the streets. Car centred suburbs are 'obesenogenic'*

> *(fattening) and foster depression and isolation by discouraging social interaction, walking and cycling."*
> Dr Rob Moodie, Chief Executive Officer, VicHealth.

The Heart Foundation, Diabetes Australia and Cancer Council have identified heavy car use as a key factor in the overweight and obesity epidemic in Victoria. The health groups' recommended responses include:

- addressing urban planning to support walkable communities, and
- addressing public transport planning to reduce car dependency.

(Diabetes Australia - Victoria *et al* 2004)

Active and public transport (especially combined with other lifestyle and health programs) could produce health care savings, or at least lower growth in health costs. These benefits would be achieved if the daily lives of Australians were structured to a greater degree around active transport modes in tandem with public transport and less tied to polluting private motor vehicle travel. For example, an across the board reduction of only 2% in the above non-accident related costs (some of which only include direct health care costs – not indirect costs) could result in savings in excess of $1 billion p.a., as well as contributing to an improved quality of life for thousands of Australians. By way of comparison, Stephenson, Bauman, Armstrong, Smith and Bellew (2000) found that the direct health care costs attributable to physical inactivity were around $377 million p.a. although their study did not consider indirect costs such as reduced productivity or costs attributable to road trauma or pollution produced by vehicles (the main source of urban air and noise pollution). Furthermore, Stephenson *et al* describe their findings as "conservative estimates" (*ibid*. p53). Several years earlier, a technical paper that considered broader economic impacts identified net benefits amounting to nearly $600 million p.a. for each 10% increase in physical activity, or in excess of $1.1 billion p.a. adjusted for inflation (Owen 1999 cited in Stone 1999).

Other barriers to increased transport efficiency

Tax treatment

Even at the best of times motorists have a tendency to complain about the level of taxes and charges they face to own and operate a vehicle. For example, motoring bodies point to the billions of dollars collected each year in the form of fuel excise, licence and registration fees, tolls and fines and compare this to that somewhat smaller amount spent on roads. The chorus of protest has become even louder in recent times as the surge in global oil prices is reflected in the price paid at the petrol pump.

What such protests either fail to recognise or deliberately gloss over is the very large "road deficit" that exists when the full costs to society and subsidies to private motor vehicle use are included.

Table 5 summarises some key items in Australia's road deficit. Note that this deficit only incorporates direct costs and externalities and excludes indirect impacts such as increased levels of cardio-pulmonary diseases resulting from reduced levels of physical activity as discussed above.

Table 5: Comparison of revenue from motorists and costs imposed upon society

Revenue/Cost Item	Amount ($ million p.a.)
Revenue	
Fuel excise	8,500 to 12,000
Registration fees	2,200 to 3,800
Tolls	600
Insurance premiums	8,0000
Total Revenue	**19,300 to 24,400**
Expenditure, subsidies & externalities	
Road construction & maintenance	4,600 to 7,580
Land use (land under roads)	6,000 to 13,000
Congestion	11,000 to 12,800
Air pollution	3,300 to 4,300
Climate change	2,400
Noise	1,200
Accidents	5,000 to 15,000
Tax deductions for car use	2,800
Qld fuel subsidy	500
Total costs	**36,800 to 59,580**
Road deficit	**17,500 to 35,180**

Sources: BIC 2001, Laird et al 2001, BTRE 2004; author's calculations

True allocative efficiency can only be achieved where motorists incorporate all of these costs into their decisions rather than imposing them upon society in general. Failing to do so results in an excessive number of cars being driven an excessive number of kilometres and consuming excessive quantities of fuel (i.e. cars that are not as fuel efficient as they might be were all costs internalised). Although the pricing of externalities can be complicated, increasing the level of taxation and charges on fuel and road use could provide more appropriate price signals.

Theoretically road user charging, as opposed to fuel excise, is a more appropriate instrument to internalise some of the externalities of motoring such as noise pollution and road wear (EEA 2004). In practice, however, applying road user charges to all but a relatively small number of key arterial roads is unlikely to be technically and/or politically feasible, especially in the case of existing roads (e.g. James 2003;

Productivity Commission 2004a). This limitation would mean that large numbers of vehicle journeys could avoid road user charges altogether, particularly most of the shorter, local journeys that are best suited to a switch to non-motorised modes of transport and are driving much of the growth in local traffic (e.g. "Mum's taxi" to educational and sporting venues; Mees 2000; Bargwanna & Mason 2001; Lyth-Gollner & Dowling 2002).

In light of the above and other limits to road user charging, fuel use serves as a good proxy of road use as it varies in line with vehicle weight and kilometres travelled. Hence fuel excise is a convenient **and practical** instrument to internalise many of the externalities of motoring. Despite this suitability, Australian fuel taxation is among the lowest in the OECD and has been declining in real terms since fuel excise indexation was abolished in 2001. In contrast, many public transport fares are increased annually in line with inflation and some have even outpaced inflation (Environment Liaison Office 2004). The reintroduction of indexation to maintain the real level of excise would aid in the efficient allocation of resources and encourage moves towards greater transport energy efficiency. Furthermore, the real level of taxation on motoring should be progressively increased to fully recover the direct costs of providing and maintaining roads, traffic-related emergency services, etcetera as well as internalise a comprehensive range of externalities including:

- air pollution (e.g. carbon monoxide, oxides of nitrogen, and airborne particulates),
- noise pollution,
- greenhouse emissions,
- congestion (which is projected to cost about $30 billion p.a. by 2015), and
- property damage and personal injury resulting from crashes.

In addition to the internalisation of externalities, the removal of perverse subsidies to private motor vehicle travel or their extension to more sustainable modes would also improve allocative efficiency and environmental outcomes. For example, four wheel drives are currently subject to an import tariff half that of lighter and more fuel efficient passenger vehicles, regardless of their intended purpose and despite the greater danger they present to other road users (Newstead, Cameron & Le 2000). Furthermore, business users are able to access input tax credits on the GST component of fuel purchases and motor vehicle costs, the Fringe Benefits Tax regime currently provides an incentive to drive further to obtain more concessional treatment under the statutory formula, and the cents per kilometre methodology provides greater deductions for larger engines regardless of their business justification. Conversely no such concessional treatment is explicitly offered to public transport or active modes such as cycling. Significant improvements in greenhouse emissions and vehicle efficiency could be obtained by shifting the tax incentives away from excess travel and fuel consumption and onto efficiency as has been done in the United Kingdom with considerable savings in recurrent costs for business (Inland Revenue 2004).

Transport funding arrangements

The federal government provides over $1.5 billion in road funding each year, amounting to around $43 billion between 1975 and 1998 (Moore 2000). Commonwealth funding is directed to a range of road projects including grants to state and local governments for urban and local roads and toll roads such as Westlink

M7 in Sydney. Despite Australia's high level of urbanisation, and explicit provision for federal funding of urban public transport in the *Australian Land Transport Development Act 1988*, the Commonwealth provides very little funding to urban public transport (about 3% of the level of road funding between 1975 and 1998) which contrasts starkly with most other Western governments (Metropolitan Transport Forum 2004).

Unfortunately Australian state governments do not score much higher. For example, public transport in Melbourne only receives around 5% of the funding provided to roads in metropolitan Melbourne (MTF 2004) - about half the 9% of total transport funding it would receive if allocated on the basis of current modal share and far short of the 20% it would receive based on the modal share proposed by the *Melbourne 2030* plan. This distortionary bias towards infrastructure for private motor vehicle travel inhibits the ability of public transport to provide a fast and reliable service across our urban areas.

In line with Australia's high level of freeway provision per capita and per dollar of GDP, both average road network speed and private passenger transport energy use per capita are high by OECD standards (Kenworthy 2003). Although the average speed of urban rail in Australia/New Zealand compares favourably with the road network (45.5km/h and 44.2km/h respectively), buses only achieve around half this speed on average (*ibid*). Since, for example, only around one third of Melbourne's population has access to rail services (Coalition for People's Transport 2004), this implies that the majority of urban residents face a choice between the private motor car and a slow, infrequent bus service. As discussed above, people will not utilise public transport if it is unavailable locally or journeys are slow (ABS 2000), hence it is not difficult to see why many households opt for the energy inefficient option of private transport.

An efficient and sustainable transport funding framework would remove this bias towards private road transport by broadening the scope of *actual* Commonwealth transport expenditure to explicitly include urban public transport enhancements such as heavy and light rail extensions and modal interchanges (i.e. seamless connections between heavy and light rail, buses, cycling and walking – not more and bigger car parks for commuters). A significant expansion in the coverage of rapid mass transit could be achieved by a relatively small number of key projects such as long-awaited heavy rail extensions to Rowville and East Doncaster in Melbourne. Transport Australia (2003) has provided a sound set of recommendations relating to AusLink that includes assessment of projects' impact on sustainability, demand management, road pricing and provision for a broader range of transport modes.

A number of other countries provide useful models for reform of transport funding within Australia. For example, the Safe, Accountable, Flexible and Efficient Transportation Equity Act of 2003 (SAFETEA) in the United States of America allocates 18.6% of its $247 billion to public transport, whilst around half of capital expenditure on public transport in the USA between 1990 and 2001 was funded by the federal government (MTF 2004). Similarly European governments have a history of investing in public transport which is borne out in superior service levels and patronage compared to Australia.

Even though bicycle sales are higher than new cars (Stone 1999), Australian road planners tend to consider provisions for cyclists and pedestrians as an afterthought, if they are considered at all. New and existing roads could be made more

accommodating of sustainable transport modes by providing generous footpaths, crossings and cycle lanes, priority lanes for buses and traffic calming measures. Explicit requirements along these lines and in funding agreements could significantly increase road user safety and make sustainable transport options more practical and appealing.

Even if no additional funding for public transport is forthcoming from the Commonwealth, sustainable transport modes could still benefit to some extent if road funding were to be made conditional upon improved provision for pedestrians, cyclists and public transport in road design and management, similar to SAFETEA and its predecessors (e.g. TEA-21) in the USA which have contributed to increased bicycle use and a growth in bicycle networks (America Bikes 2003).

Conclusion

We consider that there are enormous economic, social and environmental benefits for Australia if we become more energy resilient by increasing energy efficiency.

Though we currently have significant energy exports, it makes sense from national security, greenhouse gas and climate change management and economic viewpoints to pursue energy efficiency with no less vigour than if we had no energy resources.

We support measures to decouple economic growth from energy usage and consider that energy efficiency measures have a key role.

It is in the national interest that the Federal Government takes a leading role and we present for your consideration our recommendations on the following page which broadly encompass the following themes:

- greater cost recovery on the provision of infrastructure and services for motor vehicles (including land use) and internalisation of the external costs of motorised transport,
- public and active transport-friendly urban planning policies,
- increased investment in public transport infrastructure, and
- improved provision of public transport services.

Recommendations

Although more wide-ranging collections of recommendations are available that address many of the issues raised in this paper (e.g. PTUA 2002; Tolley 2003; STCWA 2003; Transport Australia 2003; Coalition for People's Transport 2004), in the context of this inquiry we recommend:

1. Greater coverage of urbanised areas by public transport, especially heavy rail, and seamless integration of transport modes including with regional services and active modes such as walking and cycling.

2. Increased frequency of public transport services, including after hours and on weekends/public holidays

3. Improvements to public transport routes to ensure fast transit times through:

    (a) redesigning meandering bus routes, and

    (b) better coordination of timetables for connecting and complementary services.

4. Granting priority to public transport, cycling and walking in terms of road space and traffic signals, and provision of dedicated corridors for rail.

5. “Carrot and stick” measures to encourage driver behaviour that is more considerate of pedestrian and cyclist safety.

6. Reforms to town planning practices to ensure:

    (a) all urban households are within comfortable walking distance of shops and public transport and that direct public transport routes and corridors are achievable and protected in both new and existing urban areas (Gwilliam 1996; PTUA 2002),

    (b) that new urban development is designed for convenience and safety for both walking and cycling,

    (c) new destinations like employment, commercial and community facilities are developed in locations accessible by good public transport, bike and walking and consolidated with other developments to reduce travel and driving.

7. Internalisation of the true costs of motoring through the phased introduction of measures including higher fuel taxes and road user charging with the revenues recycled into:

    (a) enhanced urban and regional public transport, walking, and cycling facilities and urban planning and street design to support public transport, walking and cycling by consolidating destinations and reducing the need to drive, and

(b) reductions in other taxes (e.g. income and payroll taxes) with some degree of emphasis on low income households and in regional Australia where the problems of congestion and localised pollution are not as acute.

8. Removal of fiscal incentives to motor vehicle use, such as:

(a) statutory methodology under FBT regime,

(b) lower import tariffs for four wheel drive cars,

(c) FBT-free car parking allowances,

(d) higher allowances for larger engines under cents per kilometre methodology.

9. Broadening the scope of federal transport expenditure to explicitly include:

(a) Funding for urban and regional public transport.

(b) The requirement that all road projects incorporate provision for active transport modes similar to the Intermodal Surface Transportation Efficiency Act and subsequent Transportation Equity Act in the USA.

(c) Assessing new proposals' triple bottom line benefits and consideration of energy use, greenhouse emissions and alternative proposals offering greater triple bottom line benefits.

(d) Locating commonwealth funded facilities (including hospitals universities, airports and department offices) in activity centres with the best public transport available in the municipality (frequency, span of hours and choice of modes) and the best possible walking and cycling access; And funding to upgrade these transport services where currently poorly provided to commonwealth facilities.

10. Strengthen support for programs that encourage active transport, especially among children, including riding and walking school buses (rather than chauffeured driving in mum's taxi), TravelSmart, and cycle parking facilities.

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Appendix A

Illnesses associated with car dependency

Obesity

At the same time as car ownership and usage has increased in Australia, obesity rates have also increased. Research from North America, Europe and Australia shows strong linkages between car-dependent sprawling outer suburbs and the incidence of obesity. Obesity currently costs up to $1.5 billion p.a. through direct medical expenses, worker absenteeism and premature death (ASSO n.d.).

Despite recognition of this increasing level of obesity, many people, especially parents, feel a reluctance to utilise public transport and active transport due to safety and security fears as reflected in the road trauma section above. Greater usage of public and active modes of transport is unlikely to occur until town planning and traffic management practices recognise pedestrians and cyclists as legitimate road users with equal priority to drivers. Until such a change occurs, obesity in the outer suburbs is likely to remain an intractable problem at great cost to families and society.

Diabetes

Type 2 diabetes costs Australia over $3 billion p.a. (DiabCost 2002). Closely associated with obesity, the incidence and severity of diabetes can be influenced by physical activity, and its impact can be expected to be reduced in a society that is geared towards active modes of transport.

Heart disease

The direct costs of coronary heart disease in Australia amount to $3.9 billion p.a., with physical inactivity being one of the key behavioural risk factors (AIHW 2001). Noise pollution has also been implicated in high blood pressure and heart disease, with motor vehicles the main source of noise pollution in urban environments.

Respiratory

Motor vehicles are the dominant producers of urban air pollution, including carbon monoxide, oxides of nitrogen, and airborne particulates. These pollutants are key factors in many respiratory ailments including asthma which costs Australia over $750 million per annum (Asthma Foundation of Victoria 2004), as well as “a range of [other] human health effects, from headaches and eye irritation to cancer” (Chertok, Voukelatos, Sheppeard & Rissel 2004).

More broadly, deaths attributable to air pollution in Australia number more than road accidents, however they receive comparatively little publicity (CSIRO 2004). The health impacts have been estimated at around $18 billion p.a. (NEPC 1998), with over $4 billion of this directly attributable to road transport (BIC 2001). Not only do private cars add to the general level of urban air pollution, car occupants are also

exposed to higher levels of volatile organic compounds and nitrogen dioxide than users of active and public transport modes (Chertok *et al* 2004).

Cancer

In addition to cancers relating to air pollution, reduced physical activity is also linked with a range of cancers including colon cancer and breast cancer which are two of the most common cancers in Australia. Colorectal and breast cancers cost the Australian health system nearly $400 million in 1993-94 (Mathers, Penm, Sanson-Fisher & Campbell 1998), suggesting current direct health care costs in excess of $500 million after adjusting for inflation.

Arthritis

The reduction in physical activity associated with increased car dependence is also associated with increased rates of arthritis which affects more than 16% of the Australian population costing nearly $9 billion p.a. (Access Economics 2001). Encouraging the use of active transport modes could reduce both the incidence and severity of arthritis in the Australian population as it continues to age.

Osteoporosis

Osteoporosis-related fractures currently cost Australia nearly $2 billion p.a. (Access Economics 2001), and this figure may well double by 2025 as the population ages (Sanders, Nicholson, Ugoni et al. 1999). Along with poor nutrition, lack of physical activity is strongly correlated with osteoporosis incidence. A more active lifestyle from childhood through to old age, consistent with a sustainable transport framework, would go some way to reducing the burden of osteoporosis on society.

Dementia

Recent studies are also highlighting the role of physical activity in the prevention of dementia among older people. Some research is pointing to a near doubling of the risk of dementia amongst inactive men (Abbott et al 2004; Weuve et al 2004). With dementia already costing Australians $6.6 billion each year (Access Economics 2003) and the prospect of this increasing as the population ages, the encouragement of low cost preventative measures such as further physical activity should be prioritised.

Depression

Depression costs the Australian economy around $15.5 billion each year including treatment costs and lost productivity (Beyond Blue 2004a). Increased physical activity, especially cycling, appears to have significant benefits in the treatment of depression (Beyond Blue 2004b; Mytanwy 2001). Some estimates suggest a 17-28% reduction in the risk of suffering depression can be achieved through regular physical activity (VicFit n.d.). As well as exercise reducing the impacts of depression, improved mental health outcomes can also be expected where social exclusion and

disconnectedness are minimised through urban planning that reduces car dependence and the provision of a quality public transport system that offers mobility to people of all incomes right throughout the day, seven days a week.