

Submission to the House of Representatives Inquiry Sustainable Cities 2025

**Reducing oil dependence to prevent the economic
decline of Australian capital cities by 2025.**

By Alan A. Parker February 28 2004

Contents	page
Introduction: cities cannot be both oil dependent and sustainable	2
Melbourne a case study of oil dependent transport.....	3
Oil dependent transport in Brisbane and Perth.....	6
Oil dependent transport in Adelaide and Sydney	7
The end of Age of cheap oil.....	8
Oil and world food production.....	9
Transition from the age of oil to the solar age	10
Adapting cities to cope with oil depletion.....	11
The outer urban fabric is not permeable.....	11
Creating a metropolitan bicycle route network.....	12
Use the ergonomic advantage of cycling over walking.....	14
Planning for bicycles to substitute for short drive alone car trips	16
Powered electric bicycles to substitute for car trips of less than 10 km.....	16
Eco-taxes are needed to and reduce oil/car dependence.....	17
Conclusions.....	19
References.....	21
Figures and tables	
Figure 1 .Melbourne journeys to work ABS census 2001	3
Figure 2 .Car dependent commuting and household density.....	5
Figure 3 Perth journeys to work ABS census 2001.....	6
Figure 4 Brisbane journeys to work ABS census 2001.....	6
Figure 5 Adelaide journeys to work ABS census 2001.....	7
Figure 6 Sydney journeys to work ABS census 2001.....	7
Figure 7 Developing Asia and the depletion of cheap oil reserves.....	8
Table 1...Showing how few options there are for the provision of bikelanes..	13
Table 2...Car trips: Melbourne all days, all purposes.....	16

Contact: Alan A.Parker

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INTRODUCTION:

NEW COMMUNITIES CANNOT BE OIL DEPENDENT & SUSTAINABLE

Judged by the flawed perceptions of overseas organisations, who use rampant consumerism and car dependence as a measure of success, Melbourne and Sydney are regularly ranked as two of the world's most livable cities. Meanwhile those who use the more objective measure of a cities ecological footprint know that Australia's cities are ecologically unsustainable now and are rapidly becoming more so. To be realistic Commonwealth has been committed to ecologically unsustainable development, since the 1960s, and despite all the rhetoric will fund a lot more unsustainable infrastructure by 2010. The car dependent lifestyles of Australians will become even more unsustainable.

To significantly reverse unsustainable trends will take till at least 2014 no matter what is done as a result of the strategic vision that emerges from this inquiry. The Australian transport system faces an oil-shortage crisis, probably within 10 to 20 years. Oil is a non-renewable resource and is being depleted rapidly by Australia's and the world's profligate use of dwindling reserves. Failure to take urgent substantial action to reduce our oil dependence will leave Australia exposed to very serious economic and social risks.

The terms of reference of this inquiry express concern with the **"environmental and social impacts of sprawling urban development"** but say very little about the disastrous economic consequences. This writer wonders why that is so when recent international conferences on oil depletion in Sweden and Paris make it very clear that age of cheap oil is rapidly coming to an end. (Laherrere 2003) (Robinson 2002) When that happens, western cities and sprawling outer suburbs that are the most dependent on the private car will suffer economic deprivation, as the petrol prices increase. (Hardy 2004).

Data from the ABS population Census reveals that around three quarters of all capital city households are located in low density outer suburbs (between 20 and 800 households per square kilometre) and in these areas 80% of households own 2 or more cars. Around 85% of the employed use a car to travel to work and as these peak hour car commutes are longer than car commutes from inner suburbs it creates road congestion. Today so many outer suburbanites are buying 4WDs that the fuel consumption of the average car in the car fleet increased after 2000, for the first time in 20 years and increased the risk of death and serious injury to pedestrians and cyclists in collisions.

Despite the decline in the average number of people living in households the output of rubbish is increasing and so is energy consumption particularly the consumption of petrol and plastic products made from oil. The new dwellings being built are bigger than they need be, are mostly not well designed or equipped with energy efficient devices. In heat waves these new dwellings increase peak loading on the power stations and drain the dams when hundreds of thousands of air conditioners and water sprinklers get switched on. Most of the homes and household products being built today are not examples of the application of sustainable design principles but of planned obsolescence and some softwood framed homes will end up being prematurely recycled by termites. Which means that even more oil is needed for the manufacture of replacements and to provide raw materials.

The inquiry discussion paper states (point 2 page 5) that "A sustainable city would successfully uncouple economic growth from increased energy consumption". Not so because overall energy consumption is not the critical issue. Australia has a few hundred years supply of coal, 50 years supply of gas, abundant wind, solar and tidal energy resources but that's not much help if the cheap oil that is weak link in the economic chain that holds the economy together is gone by 2010 or at the latest 2020.

We conclude that the primary objective of any national strategy to create sustainable cities must be to "uncouple economic growth from oil consumption and to do that as quickly as possible". If that is not done urban economies will collapse into economic chaos and poverty before sustainable products with long and useful lives can be made using the last of the cheap oil. You cannot build energy efficient homes, build wind farms and make millions of photo electric roof tiles, produce electric bicycle and many other green products or produce food to eat well without significant reserves of cheap oil. This must take place before the oil dependent world economy implodes due to huge increases in oil prices.

We conclude that by 2005 the Commonwealth needs decide that Australian oil reserves must be rationed to conserve them for building the sustainable infrastructure needed to utilise solar, wind and other renewable energy resources without which cities cannot hope to survive.

MELBOURNE A CASE STUDY IN OIL DEPENDENT TRANSPORT

The growth of car commutes and decline of sustainable transport is shown below.

Figure 1

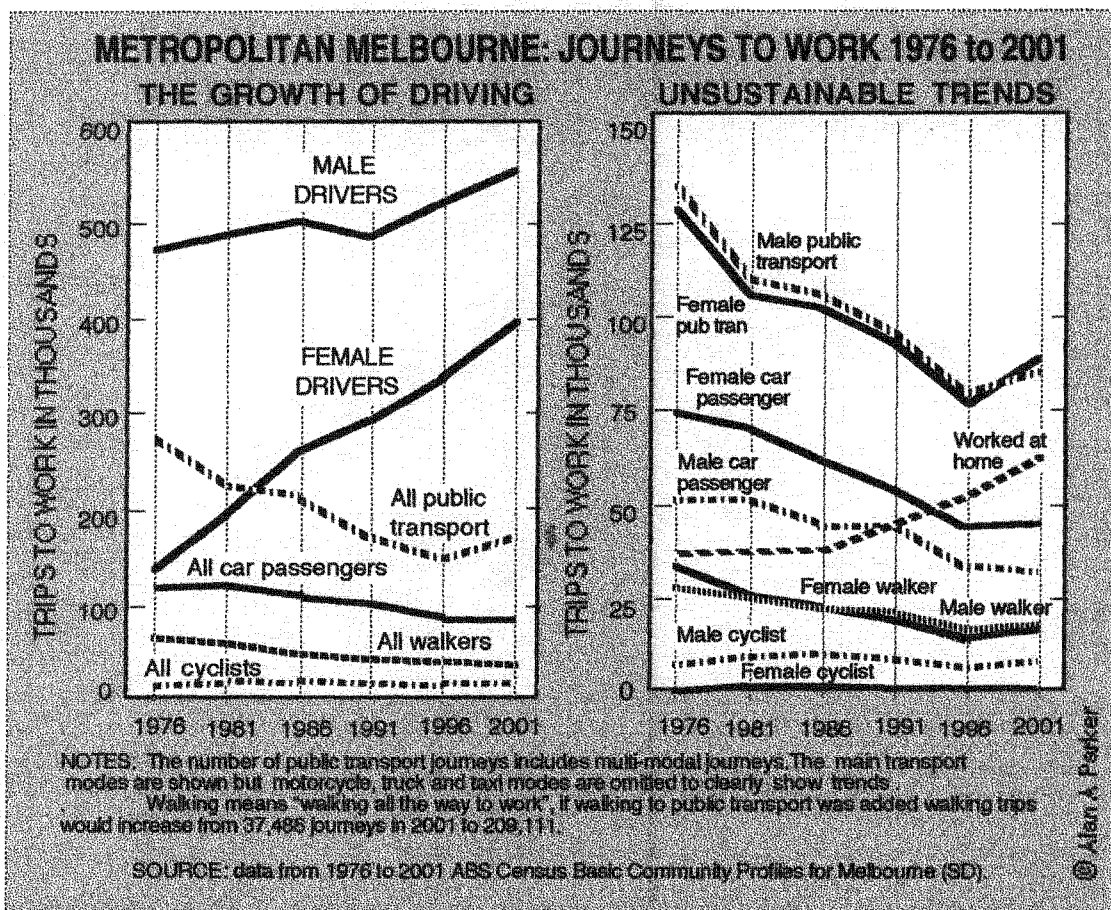


Figure 1 shows that Melbourne car commutes have increased from 620,000 in 1976 to one million in 2001. Other sources show (VicRoads 2003) that car commutes have also become longer than most other weekday journeys and in 2001 they accounted for around 32% of the total distance travelled by car. Car commutes are concentrated in the congested rush hours, subject to stop-start driving conditions and 'cold starts'. They make a 40% or more contribution to peak hour air pollution, increasing greenhouse gas emissions, oil consumption and congestion costs. In metropolitan Melbourne 80% of the journey to work were made by car and if we add the 2% of trips made by truck, vans and LCV's and motor cycles that is 82% of commutes are by privately owned motor vehicles. A huge increase compared to only 21% of journeys to work by car in 1951. Walking and cycling combined only account for 3.9% all journeys to work in 2001.

Even so the data shown on figures 1, (also figures 3, 4, 5 and 6) do not provide an accurate assessment of the contribution of urban sprawl to car/oil dependence because they fail to show the location of the most unsustainable transport behaviours that need to be changed. However plotting the household density of Melbourne's 16 statistical regions against the percentage of journeys to work by mode share and car ownership levels in households as is done on figure 2 is a sound method of providing that information. It can also be used to show an estimate of the %age of incidental exercise for work journeys involving walking all the way to work or to access public transport and cycling commutes.

Figure 2 reveals that three quarters of Melbourne households are located in low density outer suburbs (between 20 and 800 households per square kilometre) and in these areas 80% of households own 2 or more cars and around 85% of those who are employed use a car to travel to work. A strong correlation between low household density and the high %age of drive alone car commutes, the high %age of the car fleet in outer urban households with 2 or more cars, is clearly shown. Note that in the Inner Melbourne Region which has a density of 1300 households per square km commuting is a lot more sustainable now and when the oil crunch comes most households should be able to survive without petrol as they did from 1940 to 1950. Also 40% of employed people benefit from the high level of incidental exercise they get from commuting to work by a sustainable means of transport. The correlations on figure 2 indicate that when the statistical regions of Brisbane, Perth, Adelaide and Sydney are plotted it will clearly show that urban sprawl is not sustainable.

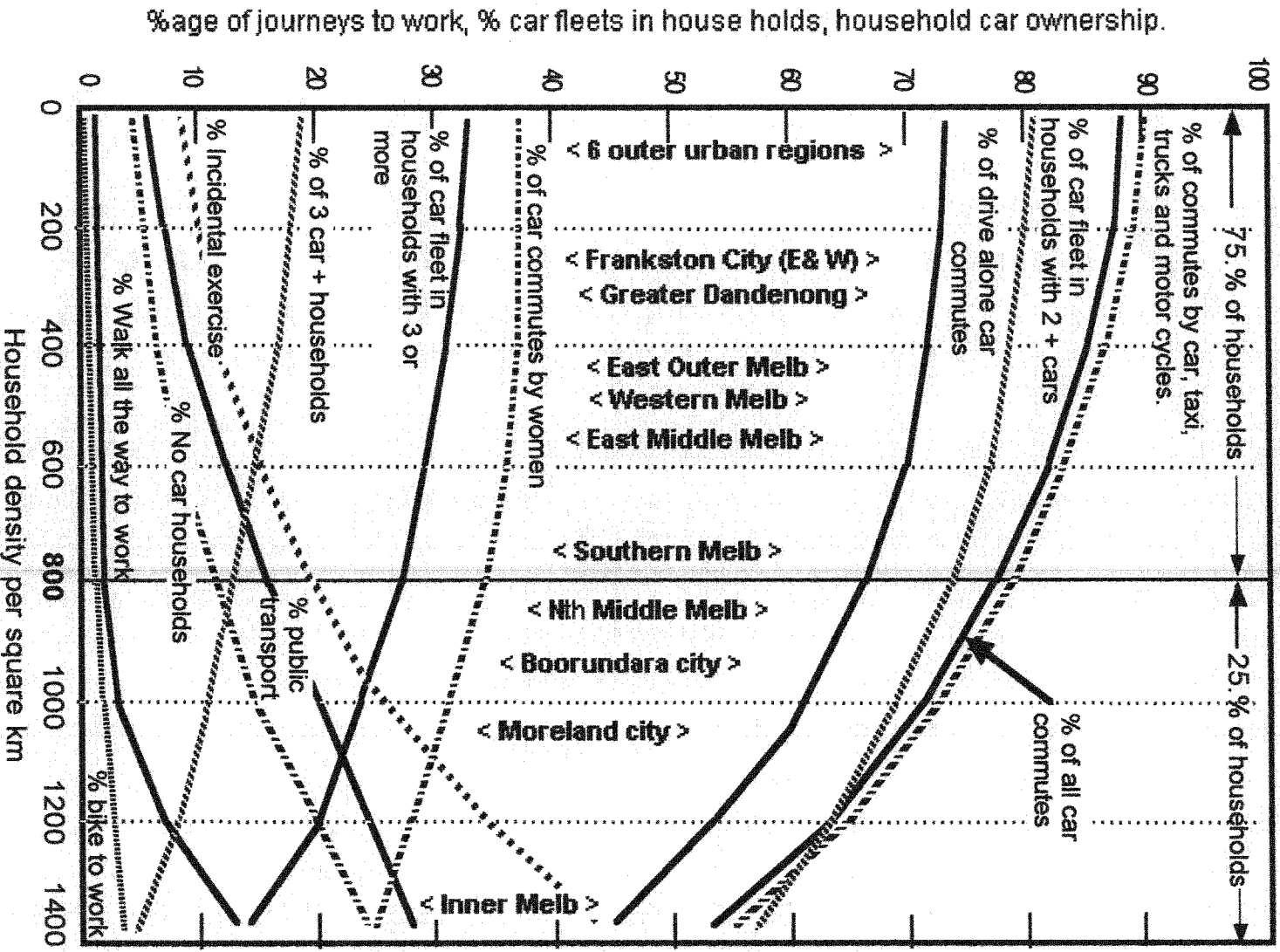
Key objectives of the Victorian government are set out in planning strategy 'Challenge Melbourne'. In transport the general idea is to reduce car dependence, to integrate bicycle planning into the overall transport and land use planning process and by 2020 to increase public transports market share to 20% of all motorised trips. Apart from there being no detailed plans to do this there is no recognition that the most important reason for reducing car dependence should be to conserve the remaining stocks of Australian cheap oil and the fact that oil shortages could destroy Victoria's economy. (Neilson 2002)

'Challenge Melbourne' has no principled theoretical position that objectively considers any worst case scenario from either a climate change perspective or a oil depletion perspective. It naively assumes a one eyed optimistic view of the future which seeks to maintain Melbourne as the most liveable city which millions of wealthy Asians will be visiting in the next 30 years. (Neilson 2002) In marked contrast many European cities have plans produced by "new urbanists" who recognise the many low-income households in urban peripheries; out of walking range of services; which must own and maintain one or more cars in order to carry out their daily lives will be reduced to poverty.

No research has been done by the DOI to confirm or deny that Melbourne low density areas are at risk sometime in the future. It seems that DOI made a consensus decision to ignore the long term consequences of oil depletion during the preparation of the 'Challenge Melbourne' strategy. (Grant 2003). Why is that, when West Australian government took oil conservation seriously in its state strategy? No wonder the Victorian government when it first came to office invested \$200 million in factories to produce 4WD's and goes along with Commonwealth policies and taxes that provide incentives to buy less fuel efficient cars.

Fig 2 Car dependent commuting and household density

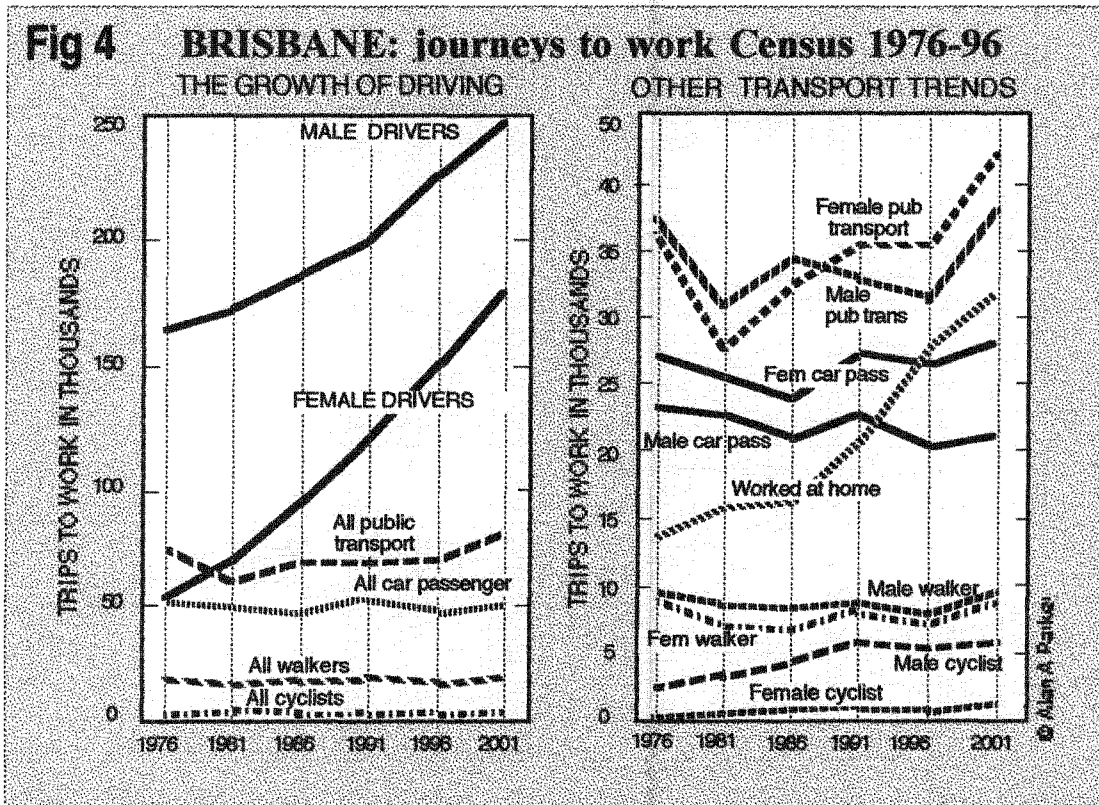
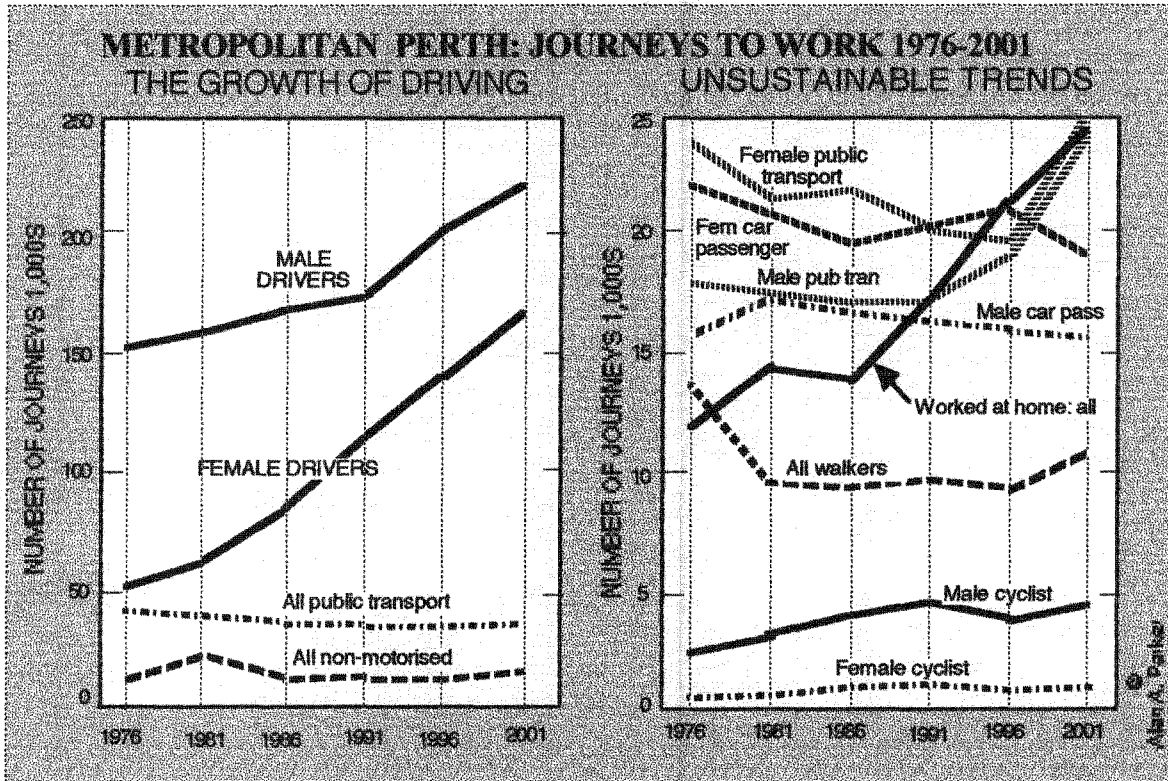
Data from the 2001 Population Census for the 16 regions of Metropolitan Melbourne. Data shows % of journeys to work by car, public transport, walking and cycling ; car ownership levels in households and the regions: the high % of drive alone car commutes and % of car fleet in households with 2 or more cars



Notes. The %age of incidental exercise = The total % age of all public transport, cycling and walking journeys. The %age of drive alone car commutes = car driver commutes minus car passenger commutes. Curves have been statistically smoothed.

OIL DEPENDENT TRANSPORT IN PERTH AND BRISBANE

Figure 3



OIL DEPENDENT TRANSPORT IN ADELAIDE AND SYDNEY

Fig 5 METROPOLITAN ADELAIDE: JOURNEYS TO WORK 1976-2001
THE GROWTH OF DRIVING **UNSUSTAINABLE TRENDS**

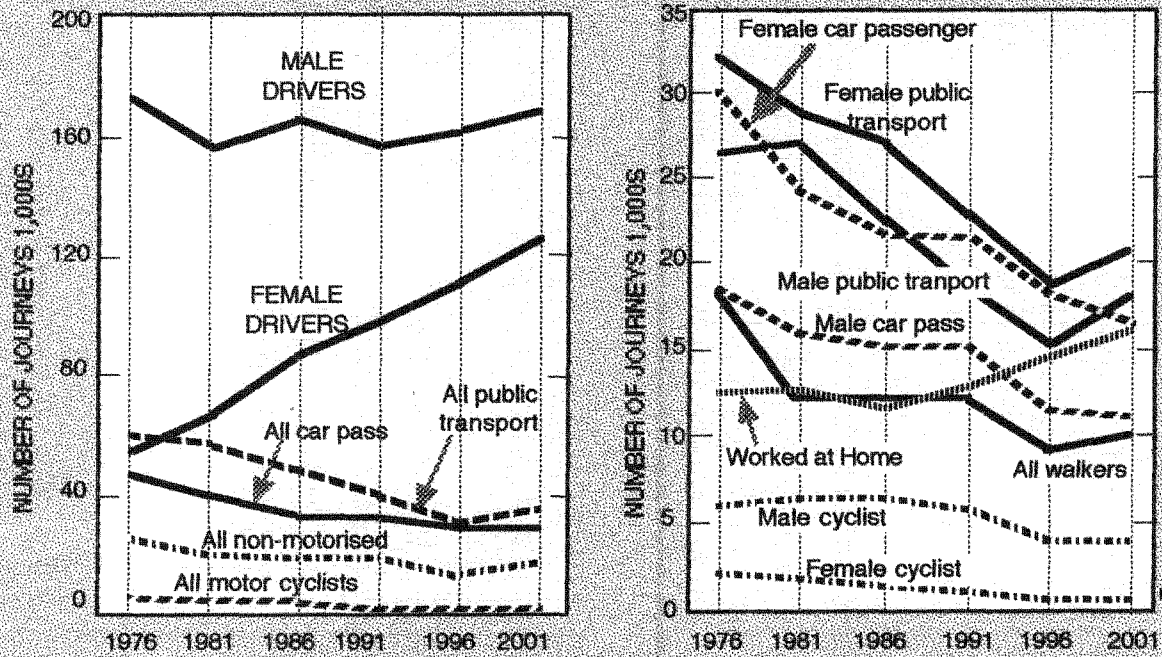
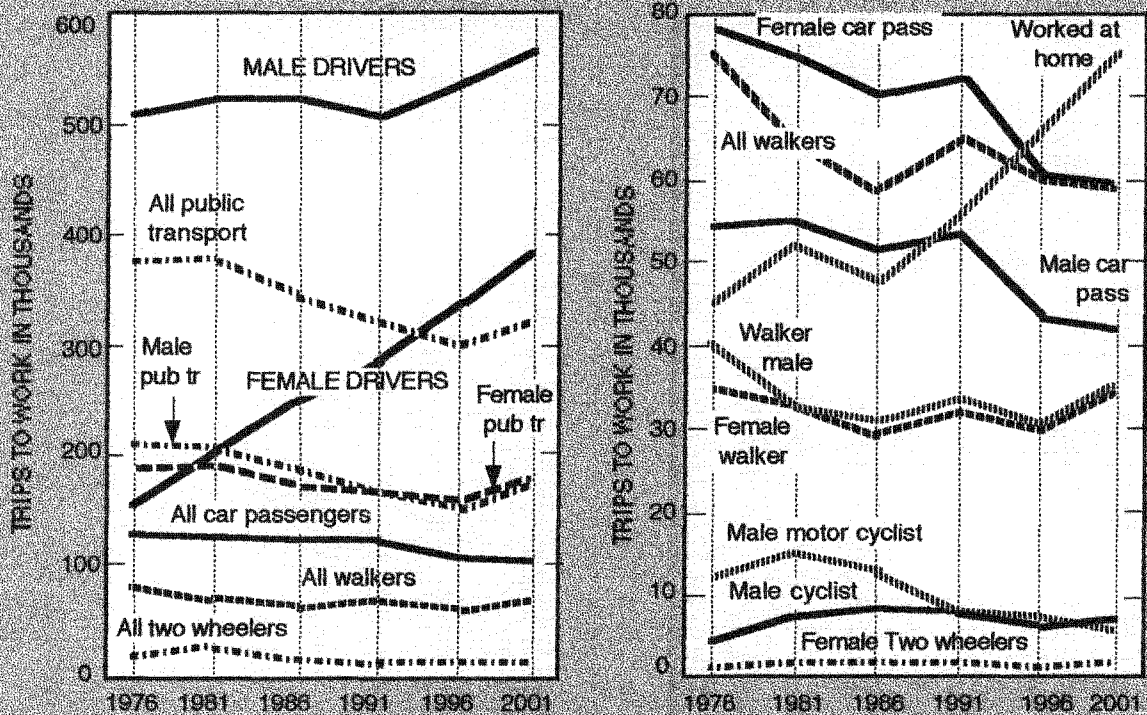


Fig 6 METROPOLITAN SYDNEY: JOURNEYS TO WORK 1976-2001
THE GROWTH OF DRIVING **OTHER TRANSPORT TRENDS**



THE END OF THE AGE OF CHEAP OIL

By the time that the current buyer's market becomes a seller's market as world oil production begins to fall New Zealand and Australia will be vulnerable to increasing costs of imported oil and serious oil shortages (Australian Energy News 2001)

The general view within the oil industry is that Australia has low oil prospectivity. Fields yet to be discovered are of small to medium size and are becoming more technically demanding, e.g. heavy oil or deep water reserves. The view of the international oil industry regarding world oil; reserves is depressing. (Laherrere, J., 2003)

Woodside Petroleum's Managing Director said recently that:

Australia has been consuming oil three times faster than it has been discovered. Projections by Australian Government forecasting agencies indicate that Australia is facing a rapid decline in liquid petroleum production over the next decade. Liquid petroleum self-sufficiency is expected to decline from an average of 80-90% over the past decade to less than 40% by 2010. The economic implications for Australia are significant including a rapid deterioration in Australia's trade deficit on liquid hydrocarbons (from a surplus of \$1.2 billion in 2000/01 to a projected annual deficit of A\$7.6 billion by 2009/10). (Akehurst, 2002).

The above is most alarming as New Zealand has only one sixth of the per capita oil reserves as Australia (World Oil.com 2000) and the option of using gas as a transitional fuel for motor vehicles as proposed by Western Australian government may not be an option as N.Z. has only one fourth of Australia's per capita gas reserves. (World Oil.com 2000) However N.Z. would have access to some of Australia's oil reserves.

The May 2002 Uppsala University International Conference on Oil Depletion and the May 2003 Association for the Study of Peak Oil Conference held in Paris evidenced a growing consensus on the reality of oil depletion. (www.hubbertpeak.com.) Overall there emerged a scenario of world oil depletion of 5-10% per year, a recognition that oil reserves had been deliberately overestimated by the oil industry and that there are unlikely to be more major significant reserves to be found.

Middle East and American oil representatives issued warnings on the absence of any more major frontier regions except the Polar Regions and the increasing incidence of "dry holes". The general view within the oil industry is that Australia has low oil prospectivity. Fields yet to be discovered are of small to medium size and are becoming more technically demanding, e.g. heavy oil or deep water reserves. The view of the international oil industry regarding world oil; reserves is depressing. (Laherrere, J., 2003)

For several years for every new barrel of oil discovered four barrels of oil have been consumed. Once peak oil production is passed, costs rise and quality tends to decline. Australia and N.Z. will be exposed to a national decline in oil production at the same time as the overall world production is predicted to decline, leaving it vulnerable to serious oil shortages and price spikes. The world oil market is expected to become a seller's market as early as 2004 and by the latest 2020. Temporarily the balance of power will shift towards OPEC, but even Middle East production is expected to start falling around 2010 (Robinson, 2002).

In the short term we can expect brief but unexpected oil crises and over the next decade significant changes in oil pricing. A crisis in supply-demand balance is likely to emerge within 20 years as the impact of the growing demand of the developing economies competes for a dwindling supply with the high demand from developed countries. Oil depletion has major implications for the global economy, as well as national economies, and involves major equity issues for the world's poor who will need access to affordable energy, especially for agriculture.

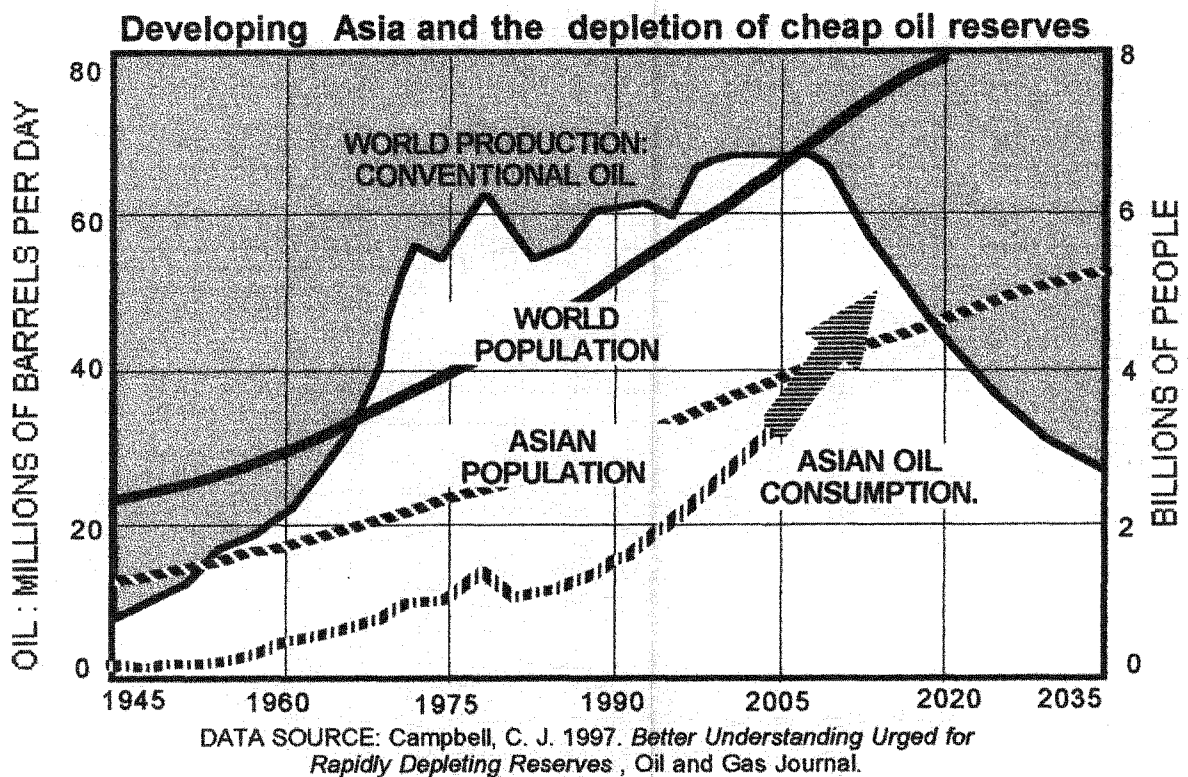


Figure 7 shows the overall situation world wide as car production increases and increasing car use in the developing countries of Asia.

OIL AND WORLD FOOD PRODUCTION

The historical record shows that oil based agriculture is primarily responsible for the world's population exploding from 2 billion in 1938 to 6.3 billion at the turn of the 21st? For example figure 7 shows the consumption of oil in Asia from 1945 to around 2010 and it relation to world production of conventional oil which in this submission is called 'cheap oil'.

Oil allowed for farming implements such as tractors, food storage systems such as refrigerators, and food transport systems such as trucks. Most pesticides are petroleum (oil) based, and all commercial fertilisers are ammonia based. Ammonia is produced from natural gas. As oil production went up, so did food production, and the worlds population. We are now at a point where the demand for food/oil continues to rise, while our ability to produce it in an affordable fashion is about to drop. Within a few years of Peak Oil occurring, the price of food will skyrocket because of the cost of fertiliser will soar. The cost of storing (electricity) and transporting (gasoline) the food that is produced will also soar. Substantial alternatives to our current cheap and abundant petrol and diesel transport fuels are unlikely.

It is not possible for Australia to produce biofuels in sufficient quantity to replace petroleum as the prime transport fuel. For example if all of Australia's current wheat production were converted to ethanol, it would provide less than 10% of our fuel needs. Most biofuels still require a lot of petroleum for their production, refining and distribution as well as the diversion of land from food production.

The developing world is not going to tolerate using wheat to make ethanol when there is going to be so much starvation abroad and neither will decent Australians. Also Oil is required for a lot more than just food, medicine, and transport. It is required for nearly every consumer item, water supply pumping, sewage disposal, garbage disposal, street/park maintenance, hospitals & health systems, police, fire services, and national defence.

THE TRANSITION FROM THE AGE OF OIL TO THE SOLAR AGE

The world faces a major challenge to find clean and enduring sources of energy. A more comprehensive industrial transformation towards sustainability is needed in developed countries like Australia and N.Z., including an all-of-government approach to decoupling per capita economic growth from per capita oil consumption as they are trying to do with some success in the Netherlands (NEPP 3 1998)(Parker 2001 A) Failure to create and implement national energy security policies could create a long lasting economic depression with very high and intractable levels of unemployment.

The car and roads lobbyists active in Victoria argue that the 'Hydrogen Economy' promised by President Bush is the answer to the depletion on oil supplies. The lobbyists purpose is to divert attention from practical and immediate oil conservation options. Fortunately several sound reports emerged in 2003 suggesting that hydrogen powered cars are very costly and impractical. The reality is that in 2004 hydrogen requires large amounts of energy for its manufacture and distribution. For the foreseeable future, the vast bulk of the world's hydrogen will continue to be made from petroleum sources. Hydrogen only accounts for 0.01% of global energy at present.

Another practical constraint is that existing vehicles and aircraft fuel distribution systems are not suited to it.(Bossel and Eliasson, 2003) It takes more energy to create it than the hydrogen actually provides. Liquid hydrogen occupies four to eleven times the bulk of equivalent gasoline or diesel. (Forrest 2003)

A hydrogen economy cannot be created in time to cope with coming oil shortages. This was confirmed by a 2004 report from the US National Academies of Science which has concluded that under the best case scenario the hydrogen transition will do little to cut oil imports or greenhouse gas emissions during the next 25 years. This is because of the many technical, economic and infrastructure constraints and casts doubt on the timetable laid out by the Bush administration's \$1.2 billion hydrogen plan. Bushes plan is a pipe-dream, like fusion power reactors using Helium-3 mined on the moon and the existence of Iraqi weapons of mass destruction.

Its true that hydrogen can also be made from renewable energy sources of wind, solar and hydro to separate the hydrogen from oxygen in water. The decentralised production of hydrogen from large wind turbine (more than 1 Megawatt) is a low cost use of excess of wind power which enables hydrogen to be used locally to power machinery and vehicles. Using wind power in this way allows electricity to be fed into the electricity grid at times of peak load and in the off-peak periods for much of excess electricity to be used to make hydrogen. However it will not be done on a massive scale to make up for the millions of barrels of gasoline used each day in the USA because 75% of the electricity from wind turbines is lost in producing the hydrogen which must then must be used locally as a lot more energy would be wasted in transporting it long distances.

The transition from the age of oil to the solar age is undoubtedly a democratic issue. It is reasonable for citizens to be able to decide for themselves how to live and have the long term consequences of their choices spelt out to via public consultation. A worse case scenario the Victorian Department of Infrastructure chose to ignore.(Nielson 2002) that meant that the strategy 'Challenge Melbourne' was flawed because the public consultation process and failed to tell people that if they cannot kick the habit of oil dependence in the not too distant future they will finish up having to use public transport for far more than

20% of their trips and have no choice in the matter because as oil dependent industries close down, it will create mass unemployment.

Oil dependence is a priority planning issue. Planners and politicians are the only ones who can be expected to have an overview that permits them to see how they can steer future developments. (Olav-Arnistberg 2004) If the planners cannot see why they must steer future development the generally public is being badly informed.

ADAPTING CITIES TO COPE WITH OIL DEPLETION

This inquiry needs to consider the economic threat of oil depletion to the viability of outer urban areas and suggest that 'Challenge Melbourne' and other capital city strategic plans needs to be rewritten with a new objective of reducing per capita oil consumption while maintaining the quality of life and achieving the following.

1. planning agencies and particularly main road authorities must openly recognise that oil use is clearly unsupportable in the long term. To that end there is a need to change state Transport Acts and redefine main road authorities role so that the governments policy objectives for encouraging walking, cycling and public transportation will be implemented.
2. There is a particular need to define main road authorities role in creating a close knit bicycle route network that link main road and collector road bike lanes and residential street to the off road shared footways used by cyclists, pedestrians and the disabled. And generally enabling bicycles to substitute for short drive alone car trips made on cold engines. Outer urban main roads must be made safer for cyclists and pedestrians and priority to given to buses and light rail vehicles using these roads. A properly constituted pedestrian/bicycle planning unit with a budget of around \$32 million a year is required for the city of Melbourne (Parker 2000).
3. Make the urban fabric of outer Melbourne far more permeable for walkers and cyclists so as to provide safer and more convenient access to an enhanced public transport system. A study to identify all the existing and future constraints to walking and cycling is urgently needed for the whole of Melbourne similar to Map 1 (Appendix A).
4. Use the ergonomic advantage of cycling over walking to increase the catchment area of the existing rail network and new trunk bus routes and replace a large proportion of long urban car journeys. Use a significant proportion of the commonwealth funding of \$2.4 available for secure bicycle parking at rail stations in the three financial years starting in 2004/5.
5. Promote the use of electric bicycles powered by roof mounted photo electric panels or roof tiles that could recharge the electric bikes batteries as is being done in Japan.

The above recommendations are expanded in the the next few pages.

THE OUTER URBAN FABRIC IS NOT PERMEABLE

Apart from the low urban densities of the outer urban areas their fabric is not permeable because there are long waterway barriers of rivers and creeks, intermingled with large man made barriers of railways and freeways many of which are more than one km long that divide communities. In Melbourne there are thousands of sections of main roads of 500 metres to 2 km long on which there are no safe crossing points for children and elderly pedestrians. These lengths of arterial road are barriers to walking and cycling and lock many people into car dependent transport behaviours.

Adding to the problems of walkers and cyclists is the provision of roundabouts on outer urban main roads makes them far more dangerous for cyclists and pedestrians than the main roads in inner urban areas which have a signalised crossing every 200 metres or less. For example see 2004 Melbourne Melways maps 13, 14, 25, and 26 showing the extensive use of roundabouts on main roads and collector roads (shown in orange) There are similar examples in other cities. Note that single lane roundabouts on local streets with 40 kph speed limits are not a threat to cyclists and pedestrians if motorists actually abide by the speed limits.

There are hundreds of curvilinear street development with cul-de-sac streets systems that do not provide shortcuts for walkers and cyclists through the residential areas to public transport stops and stations and local shopping centres are also deterrents to walking and cycling.

The provision of large car dependent shopping centres that cannot be conveniently accessed by foot or by bicycle increase car dependence. Why does this still happen here when Dutch planners no longer permit such developments. (Parker 2001 A) New urbanism is alive and well in the Netherlands where smaller scale shopping areas that service residential development of around 40 hectares are always provided in new areas.

In many of the older areas of Melbourne the railway lines through residential areas are permeable for walkers and cyclists because there are so many pedestrian underpasses, foot bridges, road bridges, level crossing and at grade pedestrian rail crossings. Indeed it is possible to cross the railway every 200 to 400 metres. Not so elsewhere especially in the outer urban suburbs. Hundreds of roundabouts on outer urban main roads are dangerous for cyclists and pedestrians (Robinson 1998) because VicRoads and other main road authorities ignore Dutch bicycle friendly roundabout designs and fails to put in enough signalised crossings. (Parker 1998)

Also VicRoads and other state road authorities approved legislation that allowed bullbars that increase the severity of bicycle and pedestrian injuries. (Parker 1995) (Bowd 1995) VicRoads is not encouraging walking and cycling and safer use of vehicles as they do in the Netherlands and Sweden.

Studies are needed to identify all the existing and future constraints to walking and cycling in all Australian cities to be used as an important coordination tool for many agencies involved in new developments. On the footpaths along main roads and collector roads large numbers children aged 7 to 11 years and are legally allowed to ride bicycles alongside pedestrians of all ages. The footpath network is as equally important as it connects with the 'shared footways' used by walkers, the disabled and by cyclists of all ages in off road areas.

CREATING A METROPOLITAN BICYCLE ROUTE NETWORK

This section uses Melbourne as an example but the data presented also applies to main road in all Australian cities except Sydney which has many narrower main roads than other cities making it very difficult to provide many bike lanes. However there is a lot of scope for developing alternative route on back roads in Sydney but will cost far more than in other cities. However the cost and the effort would be worthwhile as power assisted bicycles could be used to overcome the constraint of Sydney very hilly terrain. (See page 16)

VicRoads have no reports, stating which main roads had enough width for them to have widened kerb lanes, bikelanes, shared car parking/bike lanes or have road reserves with enough space for new shared footways or widening existing footpaths and making them shared footways.

The separate networks of local road routes, shared footways and main road bike lanes must be linked together in coordinated way so that cyclists end up with a continuous network of bicycle of routes by 2012. The VicRoads plan to create a bike lane network in ten years in 1993 was never completed and only 50% of the network has been completed. (Parker 2001B)

There are just too many four lane main roads 13.2 metre wide or less to provide bikelanes (See table 1) given that VicRoads rarely allows the centre lanes to be less than 3.15 metres. There is an even worse problem with the older main roads which are only 12.8 metres wide. Even with centre lane widths of only 2.8 metres (as in much of Sydney) table 2 shows that it is impossible to put in bikelanes and that the kerblane can only be widened to 3.6 metres which is substandard and is unacceptable on roads with B-double trucks with a speed limit of 60 kph or more. The introduction of a 50 kph limit on local roads in January 2002 and the reduction of the legal leeway given to violators to 3 kph has made cycling and walking significantly safer.

TABLE 1. Showing how few options there are for the provision of bikelanes and widened kerb lanes on old 12.8 m to 13.6 wide four lane main roads.

Road width (m)	Lane Widths(m)		Lane Widths (m)	
between kerbs	Kerblane	Centre L	Bikelanes	Traffic L
12.8	3.6 *	2.8	0.8 *	2.8
13.0	3.7	2.8	0.9 *	2.8
13.2	3.8	2.8	1.0 *	2.8
13.4	3.9	2.8	1.1*	2.8
13.6	4.0	2.8	1.2	2.8

See (VicRoads 2001) for the widths of bikelanes and kerblanes.

* Substandard widths for bikelanes and kerblanes.

VicRoads need tell the truth about their main roads that cannot be made bicycle friendly because of a lack of road space and take responsibility for providing alternative bypass routes along residential streets and to develop a property acquisition plan to bridge barriers that stand in the way of providing safe alternative routes. The provision of the bicycle route network will require hundreds of safer main road crossings to link footpaths and residential streets and these will be of great benefit to walkers and cyclists of all ages.

This submission proposes that a close knit bicycle arterial network is needed for all Australian cities. The mesh of the bike way network would be around 500m x 500 m in the inner areas and and 750m x 750 m in the outer areas. With around 7.500 km of bicycle routes that are properly signed and mapped for the whole of metropolitan Melbourne. With proportionally more or less in other cities based on population and urban density.

This is why VicRoads terms of reference in the transport act needs to be expanded to include a responsibility for coordinating the provision of all the facilities required for a close knit in bicycle arterial network, including the routes on local roads. Local government and other agencies will need around \$20 million a year in funding in addition to VicRoads spending \$10 million each year on bikelanes or shared footways along the main road network. VicRoads will need a bicycle planning unit with at least 3 engineers one urban planner and support staff for the State Bicycle Planning Council. (Parker 2000).

With proportionally more or less funding in other cities based on population and urban density rough estimates are possible of the true cost of making Australian cities bicycle friendly. The problem is the main road agencies are not really interested or motivated to make accurate assessments of what needs to be done.

If the commonwealth allocates \$200 million per year towards urban bicycle infrastructure and another \$100 million per year for Travel smart programs targeted at outer urban areas significant progress could be made in ten years if Transport Acts were changed to ensure that road agencies do what needs to be done.

USING THE ERGONOMIC ADVANTAGE OF CYCLING OVER WALKING

The ergonomic advantage of cycling over walking is of some importance for a government committed to increasing public transport patronage to 20% of all motorised trips by 2020. Map 3 (appendix C) shows the ten fold increase in railway catchment area made possible, in Melbourne's Inner West region, by cycling a convenient distance to a railway station instead of walking.

Within a rectangular street network, bicycle access uses the ergonomic advantage of pedalling over walking to go 3.5 times as far and to access stations in an area ten times as large as the pedestrian catchment. In the Austroads bike planning manual (Austroads 1999) there is a map showing that only 15 % of the population of Metropolitan Melbourne is within easy walking distance of a station but around 70% are within easy cycling distance. More precise details of the ergonomic advantage as it relates to cycling and walking and rail stations are shown on figure 4 in (Parker 2002) which is a case study of how this has been done in the outer suburbs of Brisbane.

On workdays there are 2.9 million car trips (37% of all car trips) in Melbourne of more than 5 km and bike/rail trips with a bicycle ride of no more than 2.5 km at one or both ends of a rail trip could substitute for many of these trips. About one million people commute by car or truck in the outer suburbs and it is necessary to encourage many of them to access the rail system by bicycle and enable them to use a bicycle at both ends of their trip. This means that large number cross suburban trips are then possible by bike/rail/bike dual mode travel.

It is significant that the only rail system that has greatly increased rail's market share of passenger transport in Europe in the last 12 years has done so encouraging bicycle access (ECMT 2002)(Wellemen 1997)). There is also a planning opportunity for express buses to use the freeway with bicycle locker installations at the express bus stops. The Dutch trialled such a system successfully as part of the Bicycle Master Plan (Wellemen 1999)

There is a planning opportunity to greatly increase the volume of intermodal travel by having a bicycle arterial network that ultimately connects with all rail stations and with all premium stations in the short term. (Austroads 2002) The major constraint to accessing station by bicycle is the high level of bicycle theft at premium stations and the certainty of bicycle theft and vandalism at the unstaffed stations. For cyclists to ride to stations and park their bikes secure bicycle parking, as set out in the engineering standard (SAA 1993) and the Austroads manual, is an essential requirement.

Metropolitan Melbourne is served by 218 rail stations 61 of which are premium stations which are staffed from the first train to last train of the day. There are 48 premium stations with lockers and 11 stations that are not staffed all of the time or part of the time with lockers. In total there are 59 stations with enough lockers to securely store 588 bicycles but due to poor locker management system only 300 are in use. In Melbourne there where two rail companies responsible for with approximately 300 lockers available for rental compared to Citytrain's 1900 lockers on smaller rail network in Brisbane.

For the more vulnerable rail patrons "stranger danger" is overpowering when their bicycles are stolen or vandalised. This is another reasons for introducing "Citytrain" locker management system. We can conclude from the Brisbane experience that is well documented (Gardiner 1993)(Parker 2002 the potential for growing bike/rail bike/rail patronage in the outer urban areas of Melbourne is high; providing that there are:-

- Well lit and safe bicycle access routes to stations.
- Stations are staffed from first to last train by properly trained people.
- Secure bicycle lockers or lock up rooms are provided; see standard (SAA 1993)
- The locker installations are managed in a way that ensures high occupancy and reduces any risk of locker break ins.(see pages 6 &8 Appendix D)
- The lockers are free with a \$70 deposit for a pick proof key that is forfeited if it not returned when the locker is no longer being used. (page 8 Appendix D)

The contracts of all the rail companies must be changed to make them responsible for provide secure and vandal proof bicycle parking as is done in Brisbane and to take advantage of a significant proportion of the commonwealth funding of \$2.4 available for secure bicycle parking at rail stations over 3 financial years starting in 2004/5.(Kemp 2004)

PLANNING FOR BICYCLES TO SUBSTITUTE FOR SHORT CAR TRIPS

A key objective of the Dutch Bicycle Master Plan (Wellemen 1999) are very similar to those of the DOI at a macro level. That is they both want bicycles to substitute for short car trips made on cold engines which are very polluting, contribute to increasing greenhouse gas emissions and have negative public health effects. The Dutch have been successful in achieving the trip substitution objective by the integration of demand management strategies, spatial planning strategies (C.R.O.W. 10 1993), the restriction of car parking (C.R.O.W. 11 1994) and an innovative range of bicycle programs. (Wellemen 1999)

They have not been as successful as they hoped for in their 1991 forward Planning but at least their car fleet is becoming more efficiently utilised as a consequence and they are reducing emissions whereas Victoria's passenger transport greenhouse emissions are increasing and nearly twice as high as the Dutch car fleet average.(Parker 2001 A)

The Dutch view is that the 'real cyclist' is actually an ordinary pedestrian on two wheels who wants a more convenient way to get from A to B for a trip of 1 to 3 km. VicRoads needs to learn from world best practice and adopt the Dutch approach to roads planning which is to make better use of the whole road system by reducing car travel on main roads for short trips and by increasing the proportion of substituted bicycle trips going onto the local road system.(Wellemen 1999)

Australian road agencies needs adopt the Dutch approach to road planning which is to make better use of the whole road system by reducing car travel on main roads for short trips and by increasing the proportion of substituted bicycle trips going onto the local road system.(Wellemen 1999) The Commonwealth needs a national bicycle policy which has the same overall objective as the Dutch Bicycle Master Plan and to recognise that car dependence can be reduced by making the urban fabric more permeable for walkers and cyclists while making many activity centres less permeable to motor traffic.

The name of the game is putting fine mesh bicycle arterial route together and that will require a lot of patient planning and engineering work by a team of professionals because bicycle planning is very labour intensive.Bikeway networks are not capital intensive like freeways networks which cost \$ billions. The cost of construction maybe low but there are lots of fidley bits, to plan design and construct as well tiny property acquisitions and endless consultations interested parties.

It does not cost much to provide bicycle facilities on new roads but to retrofit existing roads is sometimes impossible and often a time consuming hassle that involves all manner of organisations. To do the job properly every LGA needs a Bicycle/pedestrian planner and the Commonwealth and the states need to recognise the labour intensity and importance of this task. Until that happens new graduates will avoid this kind of work.

We know that the scope for trip substitution is very high, in Australian cities. The data from the Victorian Activity Travel Survey show that very clearly (VATS 1994 to 1998) There are 11.8 million trips made everyday in Melbourne for all purposes and 67% of these trips are made by car (7.9 million car trips) on an average day.

Table 2 CAR TRIPS: Melbourne all days, all purposes.

Distance.....	Drivers	Passengers	Total cars	% of trips.
0 to 1 km	624,246	373,658	997,904	12.6%
1 to 2 km	847,561	521,992	1,369,553	17.3%
0 to 2 km	1,471,807	895,650	2,367,457	30%
0 to 5 km	From VATS 1996		4,977,000	63%

When we consider the current estimates of how far cyclist ride bicycle for all purposes in Melbourne below there is huge potential for bicycles being used instead of cars for trips of less than 5km. Similar figures can be produced for other capital cities.

PLANNING FOR POWER ASSISTED BICYCLES TO SUBSTITUTE FOR CAR TRIPS OF LESS THAN 10 km.

The electric powered assisted bicycle (E-PAB); is a clean vehicle to reduce car dependence and enhance the mobility of the elderly. Nearly all the safest and most technical advanced Japanese electric bicycles (205 to 245 Watts power output) cannot be purchase in Australia because being over 200 watts they are not legally classified as bicycles in Australia.

A start can be made on realising their potential for reducing greenhouse gas emissions, air pollution, petrol consumption and traffic congestion in Victoria by lifting changing the Victorian traffic regulations. This writer has a letter from the CEO of VicRoads saying that he has no problem with that. However the Australian Transport Commission is now responsible for that and they suffer from bureaucratic constipation as evidenced by the fact that when they where called the NRTC they failed to act decisively on this issue.

In addition a fully power electric bicycle (E-Bike) with up to 500 watt power output should be legally available for the elderly, lame and the disabled to enhance their mobility subject to cost free registration. This is very important in hilly cities like Sydney.

Both electrically powered and power assisted bicycles should have pedal and speed controls that automatically reduce power progressively from 20 kmph and cut of power at 30 km per hour. The latest E-PABs and E-Bikes weigh only a few kilograms more than a bicycle.

The E-PAB as its name suggests, gives only power assistance from on-board rechargeable batteries. The most advanced E-PAB has electronically controlled power assistance via sensors in the cranks linked to a computer chip, with no clutch to worry about after switching them with a key like a car. The power assistance is provides automatically on starting, going uphill and when combating headwinds, so that they can safely be used on shared footways.

In Japan around 200,000 people over 50 have bought E-PABs -mostly women. Note that as technical improvements are made to reduce E-PAB weight they are becoming even more popular and more convenient to use by the over 50's. For the able bodied E-PABs used in the flat suburbs with only minor grades areas could easily substitute for many urban car trips of less than 10 km. On main road bike lanes it would significantly increase bikelane usage.

The 500 watt E-Bike could be fully powered for riding on level roads and would only needs to be pedalled on the steeper hills and against strong headwinds. Which would makes them very easy to control for the over sixties and the disabled if the maximum speed was automatically controlled and there was no clutch. For the able bodied E-Bikes are a practical substitute in hilly areas like coastal Sydney and some eastern suburbs of Melbourne and could easily substitute for many urban car trips of less than 10 km. On main roads with bike lanes in hilly areas it would significantly increase bikelane usage.

There over 300 models of E-PABs and E-Bikes sold throughout the world today and most are legally classified as bicycles and 3 million of them will be produced in China in 2003; . The development of E-PABs coupled with roof mounted solar PI panels for recharging, has been proven to be practical in Japan so as a sustainable product design initiative it is suggested that there is an opportunity provide imported or assembled E-PABs in new housing schemes using using batteries recharged from Australian made roof mounted solar cells. Sadly such initiatives are constrained in Victoria by poor legislation. despite the willingness of VicRoads to see legislation changed. Also those concerned with urban design seem totally unaware of the long term potential.

There are two papers going into considerable detail about what needs to be done both agree that performance based legislation is the way to go. (Rose and Cock 2003)(Parker 2003 B)

For full specifications in Japanese and English for most of the E-PABs and E-Bikes sold throughout the world today the "Cycle Press" trade journal year books are the best guide.

"Cycle Press" is a Japanese publisher serving the information needs of Asian manufacturers and distributors of around 80 million new bicycles and over 2 million E-PABs and E-Bikes per year. It produces their power assisted bicycle (Pedelec) International Year Book in English and Japanese.; monthly journal *CyclePress* and catalogues. Note that the year books are only available from the publisher. URL <http://www.cyclepress.co.jp>

ECO-TAXES ARE NEEDED TO ENCOURAGE SUSTAINABLE TRANSPORT BEHAVIOURS AND REDUCE OIL/CAR DEPENDENCE

The problem is that the Commonwealths role is fragmented to the point of incoherence and new legislation is introduced in the form of band aids for this or that problem and inevitably fails because the really important issues are ignored. There is no commitment to ESD becoming the preferred form of nation building and embodied in an Australian equivalent to Dutch National Environment and Policy Plan. (NEPP 1998).

With current Australian policies unsustainable levels of car/oil dependence will continue to increase. This also applies in Victoria as figures 1 and 2 clearly indicate. No amount of urban design in new communities in outer urban areas can stop current trends. Indeed, Australian car and light commercial vehicle users do not pay the real costs of travel; many costs are imposed on the community e.g. health effects and disruption of communities. The WA Sustainable Transport Coalition states:-

"Many transport costs are fixed (e.g. vehicle registration and insurance) or too low (e.g. fuel prices compared with many other nations) and so distort the market. This mismatch results in social and economic costs for the community and a strain on public funds. In addition there are many perverse subsidies that work against an equitable sustainable transport system, e.g. \$940 million pa subsidies to company cars.

The costs of depriving future generations of vital petroleum are not included in current pricing or policies. We are stealing resources from our grandchildren with no assurance that there will ever be any replacement for the oil they will need for fertilisers, plastics and transport.

Incorporating costs more fully in what transport users pay, e.g. through fuel prices, road user charges or other means, would send a stronger signal to influence travel behaviour, better reflect the real costs, and provide funds for sustainable transport infrastructure and for demand management". (STC 2004)

All of the above applies to Victoria and overseas the Dutch experience clearly shows Commonwealth taxing and funding policies are needed for at least ten years to build bicycle infrastructure and public transport infrastructure, to provide incentives to change transport behaviours and disincentives to constrain car use and urban sprawl. There is a need for the state government to lobby the commonwealth for the following general taxes and eco-taxes.

1. "Greening" of the tax system, in such a way, that tax reform results in the implementation of the National Greenhouse Strategy by all levels of government, actually encourages ESD and honours the spirit of the climate treaty.
2. The Australian tax system should be based on the principle that the polluter must pay, petrol and diesel fuels needs to be regarded as a harmful commodities just a tobacco and alcohol are. The internalisation of environmental costs in prices is an essential requirement.
3. As there are long lead times in taking remedial action to deal with the depletion of indigenous oil and world oil supplies, taxation reform should encourage the conservation of existing oil reserves.
4. Establish the general principle (recognised in the UK) that car travel to and from work is a personal expense and cannot be set against tax.
5. Recognise that salary packaging schemes that subsidise car travel and ownership are the most ecologically unsustainable tax practices. Indeed they encourage the overuse of cars for short trips that could be made on foot or by bicycle and encourage long urban car trips that could be made by public transport.
6. Recognise that Australian tax and planning policies combine to heavily subsidise car parking. The more environmentally responsible taxation of workplace parking spaces would give car commuters an incentive to use other modes (Boyd 1998), particularly if coupled with the provision of season tickets on public transport and or the provision of company bicycles.
7. Encourage employers to reduce the significant difference in travel costs for driving and cycling on work business.
8. For those who cannot do without cars tax incentives are needed for the ownership of more energy efficient cars and the scrapping of gas guzzlers.
9. The reform of the tax system should include incentives for tele-commuting, informal and formal sharing of cars, and innovative forms of car leasing such as the Dutch "Call-a-Car" scheme.
10. A large fuel tax increase is needed to raise prices at the pump so as to encourage fuel conservation and the purchase of more fuel-efficient cars.

The revenue raised by item 10 would enable the massive backlog in bicycle infrastructure and rail infrastructure provision to be funded, and to support the introduction of viable alternative fuels, more efficient vehicles and alternative transport systems which are environmentally acceptable and fuel efficient.

In addition the state government should for its part support the Commonwealth proposal to give priority to immigrants willing to local outside of Melbourne in rural town and provincial cities because this would reduce the projected growth of Melbourne's population.

Introducing congestion pricing for access to the inner suburbs has a lot of potential. A rash of cities round the globe is set to travel the same road as London, after the apparent success of the first year of the ground-breaking London scheme. Edinburgh and Cardiff are the furthest ahead, with plans to charge drivers to pass a cordon around their city centres, explicitly linked to raising money for trams, trains and other transport improvements. Stockholm is to start a congestion charging pilot next year and Barcelona and Milan have shown interest in the idea. In North America, San Francisco is said to be moving close to charging. And the Brazilian city of São Paulo is working on a proposal as well. The World Bank is also reported to be pressing booming cities in developing countries to use charging to curb exploding traffic growth, calling for cities in the developing countries to use charges to reduce fast-growing car use, raise money for much-needed infrastructure and free up congested buses, which are traditionally the main form of mass transport.

All of the above when coupled with measures to increase urban density should should make it easier to cope with demand for new housing and to reverse the growth of car/oil dependence.

CONCLUSIONS

This submission is not about ecologically sustainable development as such but assumptions had to be made about what environmentally unsustainable transport (EST) is. For that purpose it was assumed that the outer suburbs and provincial cities (less than 800 households per square km) are unsustainable for following reasons:-

- Per capita uses of fertile land, freshwater and fossil fuels are increasing and destroying the resources needed by its future inhabitants.
- Growing car dependence that is increasing per capita oil consumption, greenhouse gas emissions and congestion costs.
- Declining levels of walking or cycling that has over time contributed to an obesity epidemic and ill health due to the lack of exercise.
- Growing dependence on depleting oil reserves with no supportive national energy security policy to cope with the coming peak in world oil production and increasing oil prices.
- National and/or state governments that lack the political will to change unsustainable transport behaviours with Travel Smart, and tax and other incentives or to encourage oil conserving transport technology to cope with climate change and the needs of its future inhabitants. (Parker 2003)

Prior to 2003 the literature on EST focuses on a range of issues including greenhouse gas emissions for defining EST as a means for creating a sustainable city. (Gears & Van Wee 2003)(OECD 1996) However, more recent research reveals that there will not be enough oil and gas left to increase greenhouse gas emissions to the levels previously estimated by the OECD and the IPPC (Coglan 2003). So it is reasonable today to measure oil dependence as the key parameter in achieving EST. The effect of climate change is going to be horrific and the great benefit of worldwide economic downturn because increasing oil price will at least constrain the worldwide growth in GHG emissions.

Japan has had an energy security policy in place since the 1974 oil crisis which has greatly reduced the per capita use of oil in Japan and a high level railway use reliant on hydro electric sources. (Hook, W. 1994)

The Netherlands National Environment and Policy Plan has greatly increased the fuel efficiency of the Dutch car fleet apart from having 25% of their journeys to work by bicycle. It is interesting that the Inquiry discussion paper states (point 2 page 5) that:

“A sustainable city would successfully uncouple economic growth from increased energy consumption” Indeed it would and that objective of uncoupling economic growth from increased energy consumption was a basic objective of the The Dutch “Policy Document on the Environment and the economy (VROM 1997) and Dutch National Environment and Police Plan (NEPP 3, 1998).

The Dutch define the term decoupling as "Improving living standards (economic growth) while reducing the the environmental pressure.....Although the term 'decoupling' may be new, the underlying idea is not....NEPP1 and NEPP2 also aimed to achieve decoupling...to reduce emissions per unit of GDP by a factor of between 2 and 10." (NEPP3 1998)

Most of the Dutch initiatives in transport have been successfully implemented in the last 14 year since NEPP 1 was released in 1989 and have resulted increased increased public transport use, high levels of bicycle use and 40 % less fuel consumption by the Dutch car fleet. The Dutch objective of reducing greenhouse gas emissions and pollutant from transport has also greatly reduced oil dependency.

The US knows it will have to import 70% of its oil by 2020 and has used its military might to ensure its population can drive around in gas guzzling SUV's. By invading Iraq and Afghanistan the US has secured its access to oil in both Iraq and the former Asian states of the soviet union. The US now has the power to decide who lives and who dies when the oil crunch comes; Australia does not. It is concluded that Australia is in no position to invade any country with significant oil reserves by itself. It would be prudent to learn from the oil conserving actions of the Japanese and Dutch governments. Like them Australia needs an energy security policy requiring a large reduction in oil dependent passenger transport (Parker 2001A)

We also need to learn that transport behaviours are likely to change favourably if measures needed to make commuting more sustainable are rigorously implemented and honestly monitored. Figures 1 and 2 shows the useful data that is available to benchmark journeys to work which is the main cause of urban congestion. This data is available right down to local government level and even local government ward level. Monitoring and evaluating of the behavioural changes by all levels of government is possible using census data for 2006 and 2011. This will be particularly useful in the outer suburbs and provincial cities.

It is concluded that the role of the ABS Census in evaluating and monitoring the changes should be enhanced. (Parker 2003) Figure 2 clearly shows that reducing the %ageof drive alone car commutes and %age of households with 2 or more cars are the prime targets for "travel smart" and other measures resulting in an increase in public transport, car sharing, walking and cycling.

It is concluded that changing commuter transport behaviour, controlling urban sprawl and applying better urban design standards will never be given the priority they deserve if the planners fail to take the worse scenario into account and spell out the consequence to the both the politicians and the people. This submission argues that oil dependency above all other matters is the critical issue for this inquiry. The world is running out of cheap oil - so why do politicians and planners and refuse to plan accordingly ?. The Guardian Newspaper in the UK spells it out.

"Every generation has its taboo, and ours is this: that the resource upon which our lives have been built is running out. We don't talk about it because we cannot imagine it. This is a civilisation in denial."

The necessary change processes will have to emphasise oil conservation, as there appear to be no technical panaceas to enable the current high-energy consumption patterns to persist.

We conclude that the primary objective of any national strategy to create sustainable cities must be to "uncouple economic growth from oil consumption and to do that as quickly as possible .

We conclude that by 2005 the Commonwealth should decide that Australian oil reserves must be rationed to conserve them for building the sustainable infrastructure needed to utilise solar, wind and other renewable energy resources without which cities cannot hope to survive.

REFERENCES.

Akehurst, J. (2002) "World oil markets and the challenges for Australia" ABARE Outlook Conference 2002. Canberra 6-March-2002.

Australian Energy News (2001) "Oil production curve cause for concern". Dec 2001, p30, 31 & 49. Federal department of Industry Tourism and Resources.

Austrroads (1999) "Guide to Traffic Engineering Practice. Bicycles part 14." revised edition December 1999, Austrroads Sydney, see p 12 figure 2.5.

Austrroads (2002) *Improving the integration of public transport services* Report AP-R197/02 see section 2.5.1.

Bossel, U. and Eliasson, B. (2003): Energy and the Hydrogen Economy: Switzerland, <http://www.methanol.org/pdfFrame.cfm?pdf=HydrogenEconomyReport2003.pdf>

Bowd, D (1995). "Impact of bull-bars on Pedestrians". AIRIL 95, The Inaugural Conference on Accident investigation and the Law. 16-19 October 1995. Gold Coast Australia.

Boyd, H. N (1998), "Using Taxation to Encourage Cycling", Conference proceedings p 35 & 36, Velo Borealis.international Bicycle Conference Trondheim - Norway, 23 -26 June 1998.

Coglan, A. (2003) "Too little oil for global warming", Page 18 New Scientist 4th October 2003.

C.R.O.W. 10 (1993). "Record 10. Sign up for the Bike: Design manual for a cycle-friendly infrastructure." Centre for Research and Contract Standardisation, Ede, The Netherlands.

C.R.O.W. 11 (1994), "Record 11-Guidelines for a coordinated parking policy", Centre for Research and Contract Standardisation, Ede, The Netherlands.

DOI (2002) Reducing car dependence by making the urban fabric more permeable for walkers and cyclists in the Inner West Region.prepared by DOI on behalf of the Steering Committee for the Inner West Integrated Transport Strategy.

- **ECMT (2001)** *National Peer Review: The Netherlands.* Implementing sustainable urban travel policies, European Conference of Ministers of Transport, OECD Publications Service, Paris.

Forest, J. (2003) "Keeping hydrogen in perspective", EV World Friday August 1 2003

Gardiner, C (1993) "Report on the bicycle security trial" prepared by; Chris Gardiner Engineer (Intermodal Facilities) Metropolitan Region Queensland Railways.4th June 1993.

Geurs, K. and Van Wee, B. (2003) The role of non-motorised modes in an environmentally sustainable transport system" National Institute for Public Health and the Environment, The Netherlands, See chapter 3, "Sustainable Transport: Planning for walking and cycling in the urban environment, edited by Rodney Tolley, Woodhead publishing Cambridge England

Grant, J. (2003) personal communication from senior project manager in DOI.

Hardy, M. (2004) "Renaissance of the traditional city: New urbanism", AXESS Swedish on-line and print journal in English, Issue 1 2004.

Hook, W. (1994), "The evolution of Japanese urban transportation and non-motorised transport. Paper No 940954". Transport Research Board 73rd Annual meeting January 1994. Washington DC.

Kemp, D. (2004) "Communities and better places to live: the goals for 2004" Article by the Federal Minister for the Environment and Heritage, "Melbourne Age Domain" p4, 21-1-04

Laherrere, J. (2003) "Forecast of Oil and Gas Supply to 2050", Petrotech Conference, 2003, New Delhi. See www.hubberty.com.

Neilson, L. (2002) Response to question by Alan Parker at public briefing outlining the methodology behind "Challenge Melbourne".

NEPP 3, (1998). "National Environment Policy Plan 3" English Language version (NEPP) 264 pages, Ministry of Housing, Spatial Planning and the Environment.

OECD (1996) "Environmental criteria for sustainable transport Phase 1 of the project on Environmentally sustainable transport (EST) paris OECD.

- Olav-Arnstberg, K. (2004)** "Renaissance of the traditional city: The curse of Sprawl.", AXESS Swedish on-line and print journal in English, Issue 1 2004.
- Owen, H. (1998)**, "Visions for the future: cycling and the health of nations" Conference proceedings p 9 & 10, Velo Borealis.international Bicycle Conference Trondheim - Norway, 23 -26 June 1998.
- Parker, A. A (1993)** "Rights of passage; bridges, freeways and cycling" *Australian Cyclist Journal of the Bicycle Federation of Australia*. Vol. 17, No 2, April-May 1993. Examines cyclists rights of access and discrimination in Victoria.
- Parker, A. A. (1995)**. "Bullbars should be banned". *Proceeding of The Inaugural Conference on Accident Investigation, Reconstruction, Interpretation and the Law*. 16 - 19 October 1995. Queensland University of Technology. pages 253 to 261, 5 photographs and two graphs.
- Parker, A. A. (1998 A)**. "Roundabouts on main roads a non-motorised users perspective" (See also the photograp of pedestrian friendly Dutch roundabout on the front cover).*Road and Transport Research*, March 1998, vol 7.No 1. Australian Transport Research Ltd.
- Parker,A. A. (1998 B)**. "Pedestrian safety: a non-motorised user's perspective", Pedestrian safety conference, Australian College of Road Safety 29th & 30th June 1998, Melbourne, 7 figures, 11 pages.
- Parker, A. A.(2000 A)** Bicycle Federation of Australia submission in response to "Challenge Melbourne"November 2000.
- Parker, A. A. (2001 A)** "Making Walking and Cycling Safer: lessons for Australia from the Netherlands Experience". 24th Australasian Transport Research Forum, Zero Road toll a dream or realistic vision. Hobart Tasmania 17-20 April 2001. On CD rom.
- Parker,A. A. (2001 B)**, "TheVictorian Bicycle strategy 10 years on"Bicycle Federation of Australia journal 'Australian Cyclist' September-October 2001.
- Parker, A.A. (2002)** "A case study of bicycle parking at selected Brisbane rail stations" 25th Australasian Transport Research Forum, incorporating the Bureau of Transport and Regional Economics' Transport Colloquium, Canberra 2002.
- Parker, A.A. (2003 A)** "Unsustainable transport trends for the journey to work in major Australasian cities 1976 to 2001" 26th Australasian Transport Research Forum, Wellington New Zealand 1-3 October 2003.
- Parker, A.A. (2003 B)**"The electric power assisted bicycle" New Zealand Cycling Conference 2003. Bruce Mason Centre, North Shore City Auckland, 10-12 October 2003
- Parker, A. A. (2004)** data from an unpublished paper
- Robinson, B. (2002)** "Global Oil Vulnerability and the Australian Situation: a background paper for WA State Sustainability Strategy", Dept. of the Premier and Cabinet: http://www.sustainability.dpc.wa.gov.au/docs/background_papers.htm
- Robinson, D. (1998)**. "Accidents at Roundabouts in NSW", Road & Transport Research, ARRB April 1998.
- Rose, G. and Cock, P. (2003)** "Encouraging E-BikeUse: the need for regulatory reform in Australia.Working paper ITS-WP-03-19", Department of Civil Engineering, Monash University.
- SAA (1993)** "*Australian Standard AS 2890.3 -1993. Parking facilities part 3: bicycle parking facilities*, Standards Association of Australia.
- VATS 1995**, "Victorian Activity and Travel Survey. Preliminary results 1994 survey data" Transport Research Centre RMIT Melbourne.
- Welleman, A. G. (1997)** *Bicycle Parking in the Netherlands*. CROW Centre for contract standardisation in Civil Engineering, Ede, The Netherlands
- Welleman, A. G. (1999)**, The Dutch Bicycle Master Plan: Description and Evaluation in a historical context", English language of *Transport and Public Works and Water Management*. The Hague the Netherlands.
- Wong, V. (2003)** "Bulletin 6, Environmental Indicators for Melbourne" Published by the AIUS and the City of Melbourne, available at www.melbourne.vic.gov.au
- World Oil.com (2000)** "World crude/condensate production and wells actually producing -1999 versus 1998" www.world/magazineoil.com 20th September 2000