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The Missing Link Between Sustainable Passenger Transport and National Environmental Planning

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Abstract

Transport plans for Australia's major cities all claim to produce sustainable outcomes when reliable data show a robust trend of increasing greenhouse gas emissions. Since the mid 1970s there has been steadily increasing levels of unsustainable motorisation, the collective decline of all the more sustainable forms of transport for the trip to work and for all trips generally. The most dominant trend is the rapidly increasing proportion of Australian women who work and are choosing to drive because they have the perception that the more sustainable modes are not a safe way to travel.

Data from the Netherlands are presented showing that since 1989 motor vehicle dependence was constrained and public transport increased to a targeted level by the implementation of the Netherlands National Environment and Policy Plans (NEPP 1,2 and 3). Furthermore "child safe" residential precinct planning and a high level of investment in bicycle infrastructure from 1975 has made non-motorised travel safer and just as many people walk for all purposes as they did 20 years ago; bicycle use has been increased and more women are now cycling than men. The carbon dioxide and pollutant emissions of the Dutch and Australian (urban) car fleets are compared. The performance of the Dutch car fleet is far better partly because around 8 billion kms of bicycles trips have substituted for short car trips.

The Dutch experience shows what can be done given the relevant funding, tax and policy changes by all levels of government. Unless ecologically sustainable development (ESD) becomes the preferred form of nation building and embodied in an Australian equivalent to NEPP then unsustainable levels of motorisation will continue to increase. Tax and policy measures are recommended that are needed in addition to the National Greenhouse Strategy and the National Bicycle Strategy to reverse unsustainable transport trends

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Introduction

As yet no country in the world has made a total commitment to achieve ESD least of all in passenger transport which in most countries including Australia has become less sustainable with increasing levels of motorisation However for 10 years The Netherlands has been moving slowly towards ESD as result of a commitment to a National Environment and Policy Plan (N E P P 1998) that drives national planning

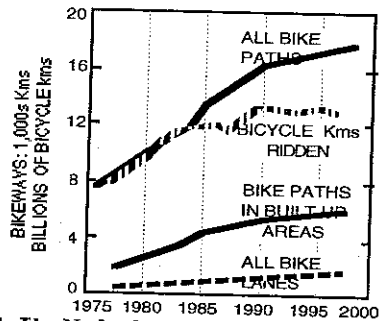


Figure 1. The Netherlands: length of bikeways (kms) and billions of kms ridden by bicyclists.

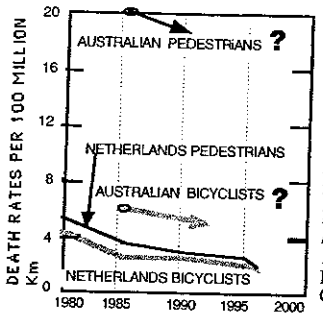
The Dutch objective is to slowly decouple the growth of GDP from the growth in fuel consumption (N.E.P.P 1998) The growth in Greenhouse gas emissions from passenger cars has been constrained, the proportion of walking trips has not declined, rail patronage has increased and proportion of "everyday cycling"trips has increased since 1975 (see figure 1). All this was done in order to implement the following Agenda 21 (Rio de Janeiro 1992) transport strategy which all Australian state governments subsequently endorsed:-

Transportation strategies should reduce the need for motor vehicles by favouring high occupancy public transport and providing safe bicycle and foot paths Municipalities need to be developed in ways that reduce the need for long distance commuting

Commonwealth and most state planning in Australia ignores the above strategy and there is no specific commitment to uncoupling the growth of GDP from the growth in fuel consumption. Since the 1970s there there has been a decline of all the sustainable transport modes except cycling which in some cities has increased and declined in others. Worst of all there is no overall national environment plan with a commitment to ESD on par with the Dutch NEPP. The overall failure of environmental planning is beyond the scope of this paper, which is confined to the passenger transport sector where the growth of unsustainable motorisation, especially for chauffeuring children and the trip to work, seem unstoppable. Indeed, the National Greenhouse Strategy (NGS) bluntly states that:-

Transport was responsible for 24% of emissions produced through activities involving the use of energy in 1996... Cars were responsible for 56% of these emissions.... In the absence of further measures to limit greenhouse emissions, domestic transport emissions will increase by 42%, on 1994 levels by the year 2015....P 55

Furthermore cycling and walking are much safer in the Netherlands (see figure 2) per kilometre travelled than Australia, but in 1996 the overall road death rate of 7.6 per 100,000 population was much lower than Australia's 10.1. The dark side of the Australian pedestrian data is that, despite the decrease in walking for all purposes, shown in some studies, there has been no corresponding decrease in the death rate per million walking km .Sadly, national exposure data has not been collected since 1986 (INSTAT 1986)

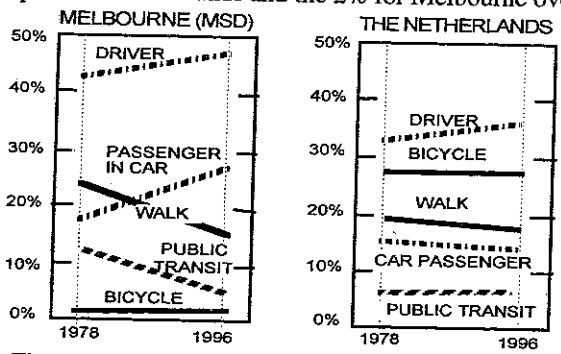


DATA SOURCE:
Welleman, A. G.1993 *Facts about cycling in the Netherlands* Ministry of Transport and Public Works.
Kernijfers verkeersonveiligheid 1996, Ministerie van Verkeer en Waterstaat.
INSTAT 1989, *Road fatality rates in Australia 1984 -1985: Summary Report* Federal Office of Road Safety CR84 June 1989

Figure 2, Australia and The Netherlands: bicycle and p edestrian death rates per 100 million kms

Comparing all trips: the Netherlands, Melbourne and Australia.

The decline of the more sustainable transport modes in the Netherlands (see right side graph on figure 3) is far less than for Melbourne. The most marked contrast is between the 28% of bicycle trips in the Netherlands and the 2% for Melbourne over 18 years.



DATA SOURCES:
Victorian Activity and Travel Survey data as processed by PTC Cramphorn 1981; Melbourne HIS 1978 adjusted to account for an estimated increase in walking trips of less than 400 m.
Netherlands Central Bureau of Statistics

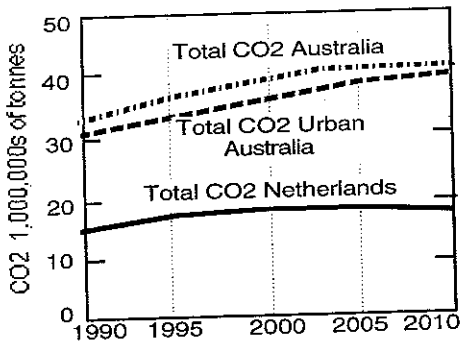
Figure 3, Melbourne MSD and The Netherlands: Percentage of all trips for all purposes 1978 to 1996

There has also been a very large increase in chauffeuring trips by car and a large decline in walking trips in Melbourne. Indeed a higher percentage of people walked for all trips in Melbourne than in the Netherlands in 1978 but by 1996 that situation had reversed.

Figure 4 shows how much more energy efficient the Dutch car fleet is compared to the Australian **urban** car fleet. Both **urban** Australia and The Netherlands have almost the same population, surface area and per capita GDP so this is a relevant comparison for the purpose of assessing the importance of environmental planning for changing transport behaviours.

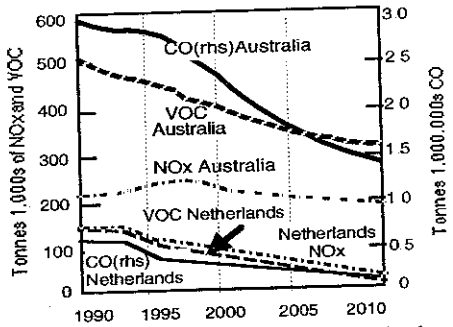
The national data on figure 5 show similar trends for CO, NOx and volatile organic compounds. The only accurate Australian data are for for carbon dioxide emissions from the car fleet. National passenger data for all trips or school trips are not available.

There is no evidence to expect a change to these unsustainable transport trends especially as the costs of company car fuel will drop by 7c per litre and the price of new car will drop by around 6 % due to the introduction of a GST. Not only that, it will increase most train, tram and bus fares by around 10%. Indeed the ABS surveys of trips to school in Victoria and other states and the 1976 to 1996 Census data for the journey to work in Australia suggest that the following trends will continue for many years: -



DATA SOURCE:
BTCE/FORS *Australian projections to 2010 from cars (ADR 37/01assumed)*
Netherlands data & projections in email to author from Geurs, K T., R.M.M. van den Brink, J.A. Annema, G.P van Wee (1998),Verkeer en vervoer in de Nationale Milieuverkenning 4, rapportnr. 773002 011. Bilthoven: Rijksinstituut voor Volksgezondheid en Milieu

Figure 4, Australia and the Netherlands: Passenger Car Emissions 1990 to 2010 of CO2 emissions from passenger cars:



DATA SOURCES:
BTCE/FORS Australian projections to 2010 from cars (ADR 37/01assumed)
Netherlands data & projections from Geurs K.T., R.M.M. van den Brink, J.A. Annema, G.P. van Wee (1998) Verkeer en vervoer in de Nationale Milieuverkenning 4. rapportnr. 773002 011, Bilthoven: Rijksinstituut voor Volksgezondheid en Milieu

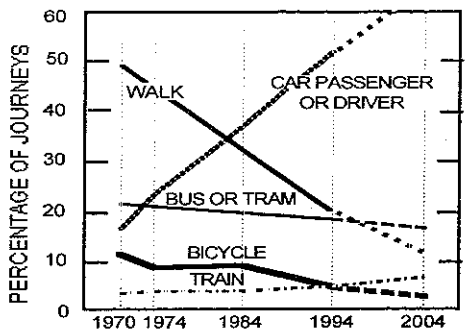
Figure 5, Passenger Car Emissions Projections to 2010 of NOx, CO & VOCs from cars: Australia and the Netherlands

- The over use of the motor car generally and the decline of informal car sharing for the trip to work results in single occupant cars causing congestion in the capital cities.
- The declining use of public transport and walking generally and in particular walking and cycling to school (ABS 1995) and cycling to stations.
- The very small increase in commuter cycling, in most cities despite a huge increase in recreational cycling and bicycle ownership by children and adults.

Some commentators have suggested that more people will use computers and work at home. However, the ABS Census show that there has been no increase in Australians working at home but a slight decrease: from 421,000 in 1976 to 414,000 in 1996. Small family businesses, such as corner shops or farms, have been wiped out by mass retailing or the rural recession and the growth of new home based businesses has barely matched that decline In the capital cities there has been a small net gain of home based work but it is not significant as cars are still used by home based businesses

The decline of walking and cycling to school, work and walking generally

The physical exercise that was once a component of ordinary living, (e.g physical work at the factory or farm, moving about walking or cycling) had hidden health benefits that health professionals have ignored until very recently and the educational authorities are not yet realised that the lack of daily exercise from walking or cycling to school is slowly making more children seriously overweight and obese This is a serious health risk in most schools especially when the status of physical education has been downgraded.



DATA SOURCE: Travel to Work, School and Shops, Victoria .ABS 1995 and 1994 catalogue No 9201.2. 10 year projection to 2004 by Alan A Parker.

Figure 6, Victoria 1970 to 2004: Percentage of Journeys to Educational destinations by Mode

The Victorian trends shown on figure 6 show a large decline in walking and cycling and a big increase in chauffeuring to schools and colleges.This unsustainable trend is typical of what is happening in other states and the UK (Hugill 1998) Furthermore we know that children are fatter today than ever before (NHMRC 1996) and that a Swiss research study shows that overprotected and chauffeured children do not do as well at school and have poorer social skills than other children (Hugill 1998). A far higher proportion of Dutch children walk or cycle to school than in Australia because residential precincts are safer and better planned.

The growth of chauffeuring is generated by frightened parents who believe that children are at risk; parents are fearful of allowing their children to play, or travel on streets because of the danger from cars, and to a far lesser extent, paedophiles. Parents are so terrified that they insist on driving them everywhere especially to school. This over protective behaviour is not beneficial for most children. The healthy habit of children walking or cycling to school is in fact discouraged by the failure to effectively reduce traffic speeds in residential areas.Many adults are likewise discouraged from walking.

Figure 7 shows the large decline in walking all the way to work in all the Australian capitals except Canberra. Nationally it dropped 8.6% of all trips to work to 4.3% in 1996 Trends suggest that the next Population Census in 2001 will most likely reveal that more Australians will drive the obesity inducing motor car and the next health survey will show they have become even fatter and more obese. According to the National Heart Foundation the percentage of overweight or obese Australians has increased from 47.6 % of men in 1980 to 54.5% in 1995 and from 26.7% of women in 1980 to 34.9% in 1995. Indeed, the health costs of not walking or cycling for all purposes due to car dependency are around $2.4 billion a year or 10% of the total health budget (Owen 1998,Roberts et all 1995). The over use of the car is not only unsustainable it is most unhealthy.

The increase in car trips to work

The large and rapidly growing number of female commuters is the dominant element in the growing demand for road space (See figure 8). Even though in 1996 journeys to work from home (or vice versa) only accounted for around 12% of all trips and around 24% of the distance travelled, these journeys were concentrated in the rush hours causing road congestion in most capital cities (Parker 1998 A).

In Australia the practice in recent years of subsidising large car use as part of the salary package and before that company car tax allowances, has resulted in an increase of single occupant car commuting (shown on figure 9 and projected to the year 2006)

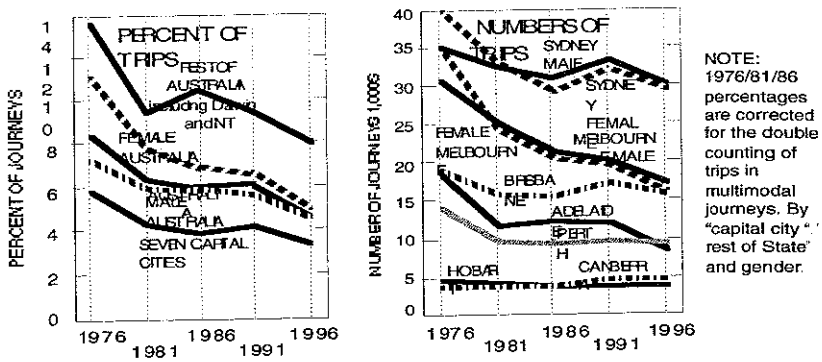


Figure 7. Australians walking to work: ABS Census 1976 to 1996

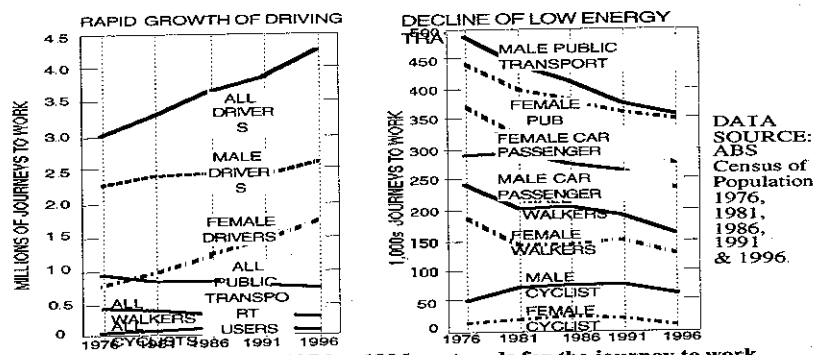


Figure 8. Australia 1976 to 1996 : trends for the journey to work

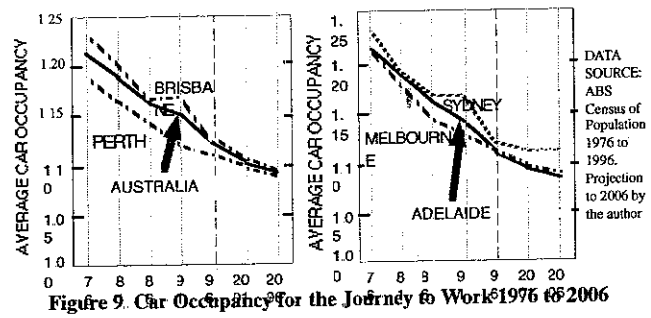


Figure 9. Car Occupancy for the Journey to Work 1976 to 2006

Clearly the decrease in car occupancy for commuting will continue to the year 2006 unless there are major changes in policy. Change is not likely because no state government has an effective demand management strategy that encourages a combination of car pooling, car sharing or Dutch style shared ownership schemes (Bakker 1995). Even so, there is the potential for a shift of at least 10% of all long drive alone commuter trips to multiple occupant trips. There is also the potential to use the bicycle as an access mode for long distance van and car pooling.

The decline of urban public transport

The overall decline in quality of service and infrastructure provision for public transport generally, and the rail system in particular, is an unsustainable trend. There are some very useful and innovative developments taking place in some cities but the overall trend nationally for all trips is that public transport is in decline (see graph 8)

Urban Rail transport in the capital cities has a better overall performance. The left graph on figure 10 shows that the percentage of rail commuters in Sydney has declined slightly from 16.2% of all trips in 1976 to 15.1% in 1996. Sydney has a much smaller loss of market share than Melbourne. The number of persons using the Sydney rail system has increased by 15,200 since 1976 (right graph) and the big increase in female users indicates that one rail authority has made system wide improvements. The rail services in Brisbane and Perth have been greatly improved in recent years but the percentage of trips is still very low despite an increase in the number of passengers. The connectivity of the bus and rail system and information systems have also been greatly improved in Sydney, as it has in Brisbane and Perth, but these improvements to not compare with the qualtiy improvements to cars, roads and car parking arrangements.

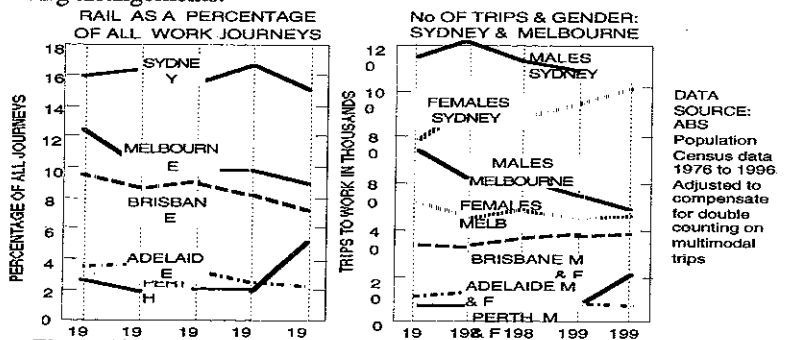


Figure 10: Australian Capital Cities: rail journeys to work. Percentages on the left. Numbers on the right.

The poor performance over 20 years of the PTC in Melbourne is clearly shown on chart 10. Not only has the PTC lost 38,000 rail passengers for the trip to work but market share dropped from 12.5% of all trips in 1976 to 8.5% in 1996. Several $million was spent every year on car parking but a negligible amount on bicycle parking resulting in over 50% of all bicycles parked at rail stations being stolen between 1981 to 1991. The bicycle theft problem on the Sydney and Adelaide rail systems was not much better.

Adult female perceptions of personal insecurity have a negative impact on all the more sustainable transport modes especially at night on public transport (Lupton 1998) thereby reinforcing the trend towards increasing motorisation. In the sprawling outer suburbs there are isolated stations and bus stops with long walking trips to them on dead streets with no people around.

Waiting for a bus in badly lit and lonely places at night makes a lot of women feel terrified. According to Enders (1998) the "Fear of crime is a reality for thousands of people public transport each day in Sydney" and has been so for years in Melbourne. Even so, a proportion of women could have quick bike ride to a station instead of a more time consuming and less safe walk, but the very high incidence of both stolen and vandalised bicycles quickly eliminates that practical alternative and reinforces the more generalised fear of crime. This need not be so and in the Netherlands where there are conductors on all trains this is not the case. Indeed this rail patrons 16 day experience travelling all over the Netherlands on the rail system, hiring bicycles at stations and inspecting secure bicycle storage facilities came as pleasant surprise after Melbourne.

In Australia uncontrolled bicycle theft, vandalism and graffiti created the perception that rail stations were unsafe places to be (Brown 1998). These deterrents to rail use in Melbourne (prior to 1996) existed on other rail systems as well but were not so extensive or were more competently dealt particularly in Brisbane. This value judgment is based on a documented inspection of all Melbourne stations (Loder, Bayly and Parker 1987) and more limited use of the other urban rail systems by this writer.

Bicycle theft at Brisbane stations was a problem until 1992 when a policy to encourage motorists who park cars at railway stations to use a "free bicycle locker instead"was introduced. As most drivers live within easy cycling distance of a station and car parking spaces cost up to $8,000 each this made good economic sense when installed locker spaces only cost around $500 per bicycle.Queensland Rail (City Train) took advantage of the funds from Better Cities Programme and provided 540 bike lockers on Brisbane stations in 1993 and 1994 and another 150 lockers on the Brisbane to Surfers rail line in 1995 In January 1998 there were 1345 lockers and a waiting list for several hundred more. Surveys showed that nearly one third of those using the lockers previously parked their car at a station and indicates potential for further growth (Parker 1996)

The cost effective and sustainable way to improve access to most rail stations is the provision of compact and secure bicycle storage facilities and the consolidation of areas around stations as compact urban villages Dutch experience in the 1990s shows that secure bicycle storage at stations and on rolling stock are very necessary and that the provision of free car parking should only be provided at stations in rural areas and for the disabled

It is not only female perceptions of personal insecurity that have a negative impact on the more sustainable transport modes a large section of the male population is impacted as well (Lupton 1998)(Enders 1998) Even so, a proportion of these people could ride bicycles instead of a taking a less safe walk There is anecdotal evidence that Bicyclists generally feel more secure in places that are threatening to pedestrians because they can move faster Even so, the Dutch are aware that the fear of crime is also a problem for cyclists and they provide much better lighting on their bikeways

Melbourne has a most unsustainable transport system

In Melbourne, the unsustainable trends shown in figures 9, 10,11 and 12 for trips to work are clear enough and it is not that much different from other cities.

While the population of metropolitan Melbourne (statistical division) increased by 804,000 from 1976 to 1996, there was only an increase of 100,000 people travelling to work on Census day. There were 1% or 7,020 fewer males travelling to work and 29% or 106,700 more females.

The large and rapidly growing number of female commuters is the dominant element in the growth of commuting in Melbourne, as it is in other cities. This resulted in 19,000 fewer women walking all the way to work and only 400 more women cycling to work. The public transport agencies lost 59,500 female public transport users since 1976 (see right graph; Chart 4) 27,900 fewer women travelled by bus, 25,300 fewer travelled by tram and 6,300 fewer travelled by train. Melbourne had a 9.5% increase in the number of people travelling to work on Census day unlike some cities which had a much larger increase: in Sydney 36%, in Brisbane 48% and in Perth 52 %.

The number of commuter cyclists in Melbourne in 1976 was 10,800; by 1996 it was 500 less and only 2000 of the 10,300 cyclists were women This is probably due to the impact of economic rationalist policies, which have destroyed much full time male employment and to women's preference for driving, given the worsening traffic conditions Women's more senior role in the work force may also have had an influence their perceptions of personal insecurity wil most certainly have had an negative impact.The influence of male sexist bicycle planning is discused in the following section

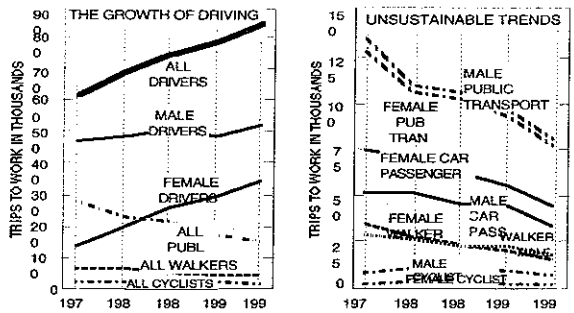


Figure 11, MELBOURNE: journeys to work ABS Census 1976-96[6]
Note: Motorcycles & taxis which are omitted for clarity

The failure to encourage cycling as a means of transport

Despite the large increase in bicycle ownership and the use of bicycles for recreation there has only been a marginal increase of cycling as an everyday means of transport. This unsustainable trend is similar in all capital cities and the Melbourne data provides a good indicator of this national trend. There has been a marginal increase in cycling for all trips in Melbourne from 1978 to 1994 which can be clearly seen on the left side graph on figure 3.

The problem in Australia is that the bicycle is only used as a substitute for a very small proportion of short car trips in many areas because of the risk of riding in fast traffic on dangerously narrow kerb lanes. In marked contrast in The Netherlands, with its well developed urban bikeway networks and 30 kmh residential speed limits, the bicycle is used as a substitute for 38 % of the short car trips of less than 7.5 km (Wellemen 1999) which is a very sustainable practice.

Cycling market share for passenger transport in urban areas is around 2% of all trips, although it varies from city (see figure 12) and a great deal within cities. The main reason cycling has maintained it market share is that in low density Australian suburbia walking is very time consuming. As a cyclist can go roughly 3.5 times as far as a walker for the same physical effort and cover 10 to 12 times the area bicycles are mostly being used today to replace walking trips of less than 2 km.

Most trips to work are much longer than the average trip for other workday purposes. Australia wide there has been only a small increase of bicycle journeys to work (figure 11) from 1.11% of all journeys in 1976 to 1.63 % in 1986 and then down to only 1.19% in 1996; this is an increase of only 8%. However when broken down by "capital city" and "the rest of the state" there very different growth rates. In total the bicycle journeys to work in the capital cities only increased from 0.87% in 1976 to 0.89% in 1996.
It should come as no surprise that Canberra, with its separate bikeway network, has the highest growth rate of all the capital cities (see figure 12). Brisbane is the next best performer, followed by Perth. In Melbourne and Sydney bicycle commuting is in a rut and in Adelaide there has been a large decline in bicycle commuting.

The reason for the decline in commuter cycling since the 1980s is that the low density suburban fringes of our capital cities are rapidly growing with inadequate public transport services and households have been locked into multiple car ownership. For example outer Melbourne has captured the lion's share of recent population growth with local government area growth rates of between 2.9 and 8.3 %. Compared to the total Melbourne population which has only increased by 1.5% and rural Victoria by 0.5%.

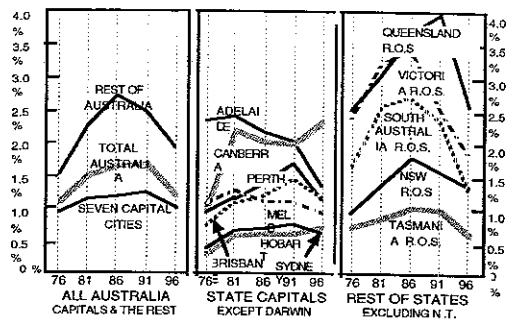


Figure 12. Bicycle journeys to work as a percentage of all journeys to work. Broken down by capital city and rest of State.
Note: ABS Census data corrected for the double counting of trips in multimodal journeys.

A similar growth of urban sprawl is is evident in other capital cities and predictably commuter trip lengths will increase so that more work trips will be beyond convenient cycling distance The 2001 Census will therefore show a further decline in bicycle trips to work despite the continued growth in recreational cycling and the production and approval by the Commonwealth transport minister of a new national bicycle strategy in April 1999.

If we are really serious about encouraging more sustainable cities we have to ask and answer some fundamental questions about the transport needs of women. For example, we need to know why in 1996 for every woman who cycles in Melbourne there are 170 women who drive to work. We need to explain why on Census day women made up 43% of the work force but this is not reflected in the proportion of the female work force (0.4%) who cycled to work. In Australia there were four male commuter cyclists for every female in 1996.

In the Netherlands there is no such gender difference for the trip to work and more women cycle to work than men.(Parker 1998 A) As we will show later Australian bicycle planning guidelines are male sexist in the sense that the bicycle facilities provided do not meet the needs of traffic wary and security conscious females - as the Dutch bicycle facilities do - because the planning guidelines are flawed and biased towards the needs of males between 17 and 40 years of age

It is likely that the bicycle will maintain its very low market share of passenger trips for all purposes by mostly continuing to substitute for inconvénient walking trips That need not be so. For example in Melbourne in 1994, 72% of car trips were less that 7.5 km (VATS 1994). The Dutch estimates of 36% of car trips of less than 7.5 km being replaced by bicycle cannot be achieved in Melbourne, even so, around 20% of trips may be possible in the longer term.The following section describes how the great potential for the bicycle as a substitute for many billions of short car trips can be realised.

Netherlands: Energy security policy and bicycle friendly roads

In Australia since the 1950s the hidden agenda amongst the transport planning fraternity was that bicycles were an obsolete form of transport. Up until the oil crisis that view was also gaining ground in The Netherlands. However in the 1974 oil crisis when cars had no petrol, trucks had no diesel and the ships had no bunker oil, Europe's greatest port, Rotterdam and many industries ground to a halt The only consolation was that millions of old two wheelers were put back in use to get people to work and it was obvious that bicycles were far from obsolete. From 1975 plans were made to make the nation less dependent on imported oil and bikepaths had a high priority in transport funding and around 8% of the road transport budget was spent on building them

The Dutch are world leaders in building road systems that constrain the growth in unnecessary car use by providing for the safe and convenient use of bicycles and pedestrians (Parker 1998 C).The Dutch also have a very extensive network of intercity freeways with completely separate network of intercity bikeways which are extensively used by Dutch cyclists and foreign tourists; and incidentally earning around $300 million a year in tourist income which covers the cost of intercity bikeway construction and maintenance. Urban freeways do not provide short cuts to motorists and longer trips for cyclist because separate bikepaths are always provided especially on freeway bridges.In marked contrast in Melbourne the two greatest shortcuts for motorists over the Yarra river, are the Westgate Bridge and the recently opened Bolte Bridge and neither provide access for cyclists or pedestrians.

The Netherlands has one car for every two inhabitants aged 18 or over and it holds the world record for number of cars per square kilometre. Indeed the overuse of cars is a major problem in the cities of Amsterdam, Rotterdam, the Hague and Utrecht. The national policy of making motorists pay for parking has constrained car use. In these cities bicycle use accounts for around 20% of all trips.Of great interest are the smaller provincial cities like Gronigen that have been actively managing the demand for passenger transport and encouraging cycling for 25 years with the most sustainable result that 55 % of all trips are made by bicycle (Welleman 1999)

From 1986 the first, second and third Dutch National Environment Policy Plans (NEPP 1, 2 and 3) have also helped to encourage cycling. Before that in 1975 bikeways were funded as a energy security measure (1973/74) The completion of the Dutch Bicycle Master Plan (1991/1997) was in fact the culmination of a 24 year long commitment to bikeway construction. Figure 13 indicates why The Master Plan has been evaluated as being very successful (Welleman 1998).

The proposed next step is more consultations with regional and local government and user organisations. This will further develop and enhance existing bicycle policy for the next ten years.One of the issues being examined is the future reduction of short car journeys by a range of measures including the further encouragement of bicycle use. The former manager of the Dutch Bicycle Master Plan program states that:-

we can easily use our cars less, as long as the will is there, particularly for the most polluting, obstructive and risky journeys - the short ones. And there are plenty of those, with over seventy per cent of trips no longer than 7.5 kilometres. The Dutch use their bikes for 36 per cent of them, walk 23 per cent and take public transport for 2 per cent. That leaves 36 per cent by car, with an average of one passenger for every three drivers.(Welleman 1998)

Bicycle network planning must be well funded and non-sexist in practice

Today Dutch "bikeway networks" provide safe and continuous bicycle routes of finer mesh than the main road network. "Bikeway networks" exist in all Dutch cities and link up with public transport modal interchanges, shopping centres and pedestrianised town centres.In the oil crisis (Fleay 1998)(Campbell and Laherrere 1998) that is inevitable a few years into the new millenium the existing bicycle infrastructure will be of great service well before GHG induced rises in sea level becomes a serious problem.

The Dutch view of bicycle network planning is that there should be two bike routes to every destination, particularly railway stations, and one of them must be socially secure. By that they mean one route must be well lit and designed in such a way so that it is perceived as being safe, particularly by female cyclists or the elderly (C.R.O.W 10 1993).This coupled with the 30 kph speed limit on residential streets, is why riding a bicycle is still popular after 30 years of motorisation and more women ride bicycles than men.(25 % of male trips are by bicycle and 32% of female trips).

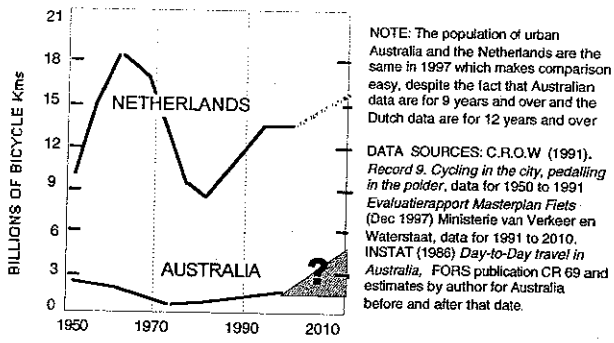


Figure 13, Billions of bicycle kms travelled for all purposes in The Netherlands (12 plus years) and Australia (9 plus years).

Figure 13 illustrates that the number of Dutch seats on saddles has steadily increased over the last 22 years; 27% of all trips are still made by bicycle in 1998. Without adequate funding "everyday bicycle" riding would have continued to decline from 1960 to 1978 in the Netherlands from 19 billion kms to 8.5 billion kms (Chart 13). Without funding bicycle travel would be down to around 3 billion kms or about double the kms cycled in Australia today but with adequate funding it has increased to 13 billion km (C.R.O.W. 9 1991). Figure 13 illustrates above all that the high level of bicycle use is not an accidental by product of traditional bicycle culture but mostly the result of national commitment to energy security and environmental planning.

Speed reduction is a crucial pedestrians safety issue in the Netherlands

The Dutch have also pioneered other road safety measures that complement the bikeway networks and benefit pedestrians, particularly children. The Dutch road safety philosophy recognises that vehicle speeds of around 30 kmh greatly reduce the risk of serious injury to pedestrians. The general urban speed limit is only 50 kph with an increasing proportion of urban roads having a 30 kph limit. The Dutch experience is that reducing speeds to 30 kph does not significantly increase travel times (Corben 1998) and figure 3 indicates that it helps maintain the healthy habit of walking.

The Dutch invented the Home Zone or Woonerf in 1971 (ANWB 1977) and there are now 6,500. Not only are cars restricted to a jogging pace (10 kph limit) but the streets are planted with trees and shrubs and have seating areas and playgrounds. Woonerfs are expensive and cannot be applied every where so in the early 1990s it was decided to have a nation wide 30 kph limit in all residential precincts. Today the Dutch claim that these measures have led to improved child health and dramatic reductions in street crime and burglary. But the biggest benefit, is the improved relationship between the very young and the very old. Pensioners spend a lot of time informally supervising children. Parents, especially mothers, find they have more time to themselves. The Home Zone concept is now being applied in several other countries.

Fewer Dutch children walk and cycle to school than 20 years ago but that decline is very small compared to Australia. Clearly if there is a relatively safe physical environment children will walk and cycle and are more likely to grow into the adults who walk and cycle. Reducing speed is a long term health cos measure that is sustainable and recognised as such in the EC Charter on Transport, Environment and Health (WHO 1999).

Environmental planning in the 1990s: carrots and sticks.

In the Netherlands in 1989, as part of the first National Environment Policy Plan (NEPP), the use of the car was actively discouraged A NEPP 2 project, is to reduce car use in cities. NEPP 2 recognised that if bicycle use is to be increased and short car trips are to be reduced it will be by a "carrot and stick "approach. In cities funding bicycle facilities and demonstration projects were the "carrot". The "Coordinated National Parking Policy" was designed to reduce unnecessary car use for short trips. This is one of the "sticks" that was successfully used to reinforce the "carrots". (C.R.O.W Record 11 1994).

Figures 1, 2, 3 and 4, showed that the Dutch are making much efficient use of their car fleet. At present only 23% of the Dutch car fleet is older than 10 years compared to 43% of the Australian car fleet and Dutch cars are on average smaller. Another factor is the 41% of passenger cars are powered by LPG which produces 14 % less GHG and significantly less air pollution (Statistics Netherlands 1997). Also, substituting around 8 billion bicycle kms for around 8 billion car kms is very effective because most short car trips are made with a cold engines that are very polluting.Without the NEPP it was expected that car kms would increase by 72% over the period 1986 to 2010. With the NEPP this increase will be lowered to 48%, a positive step towards ESD.

Of particular relevance to Australia is the potential for making short bicycle trips to rail stations or express bus stops which could easily substitute for 5% of car trips of more than 7.5 km and possibly more. This could reduce the proportion of long urban car trips between 12 and 60 km Metropolitan rail networks which spread out over large areas in Tokyo and Osaka, like they do in Sydney and Melbourne, support a very high level of bike/rail commuting. Environmental planning has greatly increased bike /rail patronage on NED Railways

NEPP 2 aimed to reduce the proportion of long car trips by increasing rail passenger traffic by 15% by 2010. High levels of everyday cycling makes this possible through improving bicycle parking at stations and implementation is already well ahead of schedule. The better bicycle access to stations and secure bicycle storage and intermodal access for buses has increased rail patronage beyond expectations. Netherlands Railways are well on the way to increasing rail passenger traffic from 9 billion passenger km in 1987 to 17 billion passengers in 2010 (RGI 1996)

In both Japan and The Netherlands the option exists to cycle to and from the stations at both ends of the journey. Furthermore secure overnight bicycle storage is provided for around 20% to 30% of bike/rail users.The bike/rail/bike option is needed in Australia to service the new employment centres emerging in the district centres of capital cities.With bicycle access at both ends of a rail trip the rail network can service journeys throughout the entire inner suburbs and much cross suburban travel as well as to the CBD.

New car parking and car sharing policies reduce car use

The Dutch Coordinated National Car Parking Policy (C.R.O.W. 11 1994) has been successful and large supermarkets sited inside massive car parks are very noticeable by their absence However NEPP 3 proposes than another "stick " to be developed in the form of new car parking policies that constrain municipalities from competing with one another by the over provision of car parking spaces. This is also an Australian problem The Dutch government will address this problem by:-

"commissioning research into the scope for effective coordination and harmonisation of both the provision and pricing of paid car parking and controlling the provision of public and private parking facilities (NEPP 3 1998)".

In marked contrast, the Australian government's $180 million program for greenhouse gas reduction is not directed to forceful mitigation measures likely to reverse increasing car use It

is in fact a wish list with very little in the way of funded programs The car dominated transport system will stay that way and even making better use of cars by sharing them is unlikely to happen. The Travel Smart programs in Perth and Adelaide are good small scale programs whose potential for scale application will not be realised because of the lack of funds

There are no schemes in operation with leasing and car hire companies as there are in the Netherlands For example "CALL-A-CAR" is a proven Dutch government initiative that enables people to be more mobile without having to own a car. "Call-a-Car" is a Dutch traffic demand measure designed to reduce car use and has been proven to work best with people who are experienced cyclists and are able to dispense with the use of a car for trips of 1 to 4 kilometres. (Bakker 1996) For the 60,000 cyclists who were former car owners it has proven to be a real money saver and car use by the participants has been reduced by 30%.

The Dutch "ABC" policy of business location

"ABC" is the nickname for the famous and influential Dutch business location policy, designed to locate "the right business in the right place". Briefly, the policy states that public and private businesses with high densities of employees and/or visitors ("A businesses") should be located on sites with high levels of service by good public transport ("A locations"). Examples of "A businesses" are large shopping centres and office blocks. Businesses, such as warehouses, with low employee/visitor densities and which need high truck or car access ("C businesses") should be located at places with good road access ("C locations"). There is an intermediate category of sites with moderately good access to both public transport service and road access ("B locations") which are suitable for businesses with intermediate transport needs.

There is a special category of residual locations with neither high public transport service nor road access ("R locations"). These are not suitable locations for any major businesses.The policy recognises that highly accessible locations are a scarce and valuable commodity in cities and that they need to be used efficiently.It also recognises that access to businesses is most efficient if they are located in the "right place".For example, an "A business" could cause unmanageable road traffic unless it is located in a transit-oriented location On the other hand, placing a warehouse near a light-rail station would be a waste of that valuable location and of the investment in the rail system

Studies have demonstrated that implementing the ABC policy is effective in significantly reducing car use and increasing the mode share for public transport. (Bartholomew 1995) Bicycles are, of course, used a means of access to public transport at the home end of a bike rail trip so that accessing an "A business" is far more convenient than it is for most people in Australian cities.The existing Australian policy of gradually increasing urban densities and urban consolidation would lead to decreased GHGs from transport if the Dutch "ABC" policy of business location was adopted by all state governments.

Green taxes to encourage sustainable transport in theNetherlands

The Dutch experience in implementing their National Environment and Policy Plan (NEPP 1, 2, &3) clearly shows that "green taxes"(eco-taxes) have great potential to increase the quality of life while reducing greenhouse gas emissions and oil dependence. Some of these measures are as follows:-

- The greening of the tax system, whereby there is a shift from the taxation of labour to the taxation of environmentally harmful activities. Direct taxation of wages and incomes will be reduced while taxes on consumption will be increased. (Depending on the environmental implications of that consumption).

- Increase in fuel tax rates (1995); increase the variable component of motoring costs by increasing excise duty on motor fuels (1997). Petrol costs A$1.60c per litre at the pump.
- Value-added tax incentives for employers to provide bicycles (1996) Reimbursement of cycle commuting costs in wages and income tax (1997)
- Increase in scope and magnitude of the tax allowance for trip to work travel costs by means of public transport and the tax free reimbursement of public transport costs in wages and income tax (1997); increased allowance (1998)
- Freeze on car commuting tax allowance (1997)
- Incentives for tele-working in wages and income tax (1997) increased concessions (1998)
- Widening and simplification of wages and income tax concessions for car pooling (1998)

The government is studying the scope for incorporating an environmental component in the excise levied on new vehicles and the annual vehicle tax so as to provide incentives for the purchase of clean, energy-efficient cars, and to optimise the fuel mix. This study is expected to be completed in late 1998.

The need for environmental planning and 'green' taxes in Australia

The Australian Greenhouse Strategy (NGS) recommends demonstration projects to get people out of cars and put bums on saddles and bus seats. The National Bicycle Strategy has many useful recommendations but these actions are insufficient by themselves to create a more sustainable transport system in which collective market share of all the sustainable modes will increase." One agency of the Commonwealth government has recognised the need to restructure the tax system so as to implement the national NGS recommendations. This is why, the NGS refers to the importance of economic policy instruments when it states that:-

"*Economic policy instruments (both incentives and disincentives) will be examined to ensure they are consistent with fiscal, economic and environmental policy, including greenhouse objective ... to be completed in 1999/2000. P 56.*"

What the Dutch experience shows is that the NGS need to backed up by eco-taxes to replace current tax incentive to overuse cars if unsustainable trends are to be reversed. 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. Internalising environmental costs in prices is an essential requirement. Furthermore a "carrot and stick" approach is needed to constrain the growth in car use by rationing car parking and road user charges; while funding the more sustainable transport modes.

Equally important is reducing emissions of GHGs and air pollutants by phasing out petrol and diesel powered cars in favour of vehicles powered natural gas via tax incentives and disincentives designed to in a few years make the Australian car fleet cleaner and more fuel efficient. It is desirable that every day cycling should, in the long term, substitute for around 8 billion passenger km of short car trips and that the other sustainable transport modes need to be similarly encouraged. Studies of what is possible in terms of modal substitution need to be made for car pooling new forms of car ownership, public transport and "shanks pony".

The release and approval (May 1999) of the national bicycle strategy (Austroads 1999) for the period 1999/2004 and the commitment of Commonwealth funding of a secretariat for the National Bicycle Council to implement the national bicycle strategy, by Commonwealth ministers Anderson and Wooldridge, will not greatly increase the use of bicycles for transport for the simple reason that the necessary $100 million of Commonwealth funding required for bicycle infrastructure each year is not being provided. Furthermore the other measures, that Dutch experience shows are necessary are not even on the the governments political agenda or that of the opposition.

In comparison to the Dutch government's actions the Commonwealth's role is fragmented to the point of incoherence. New legislation is introduced in the form of "band aids" for this or

that and inevitably fails because the really difficult problems are not addressed because of an ideological commitment to free markets. Clearly the transport trends described here show how the market has failed to incorporate the full environmental costs of many human activities and creates perverse economic and social effects.

If one of the objectives of tax reform is to change unsustainable transport behaviours then at least a start must be made in integrating tax and environmental policy. The Dutch NEPP versions 1, 2 and 3 are excellent models to study. (An English language version of NEPP 3 is available) The only Parliamentary report that has documented some, but not all of, the key policies for achieving ESD by the greening of the tax system in the transport sector was produced by the Senate. The key Democrat recommendations in the"Inquiry into the GST and a New Tax System" (Allison 1999) are recommendations 2, 3 and 4 below which have been incorporated into the GST legislation. The survival of the Australian gaseous fuels industry (LPG, CNG) which produces cleaner and greener fuels is now guaranteed.

Conclusions and Recommendations

In Australia little is actually being done to constrain the growth of motorisation; let alone reverse current trends because of market driven unsustainable development The "Greening" of the tax system is necessary so that tax reform results in the implementation of the National Greenhouse Strategy by all levels of government, actually encourages ESD, honours the spirit of the climate treaty and conserves indigenous oil reserves.

The Dutch experience shows that ESD must become more than a motherhood statement, that is used as public relations garnish for market driven economic development ESD must becomes the preferred form of nation building Having an Australian equivalent of the Dutch NEPP is necessary which would either include eco-taxes and regulations, or be supported by eco-taxes in other legislation. The following 14 measures are needed to supplement the National Greenhouse Strategy, the National bicycle strategy and most important of all to pave the way to ESD:-

- An annual petrol and diesel tax increase at the pump to encourage fuel conservation and the use of fuel-efficient vehicles.These taxes to pay for rail infrastructure, bikeway networks and funded programs to support the introduction of viable alternative fuels, and "greener" Australian made cars.
- Increased GST on energy wastefull vehicles and emissions standards for new vehicles match European standards by 2002
- The government to provide more support for the gaseous fuels industry by exempting CNG and LPG from excise and providing grants for PT vehicles and fleet cars to convert to using them. More funding for biofuels such as ethanol and methonal
- New design rules requiring all new car and LCV engines to be designed for easy conversion for the efficient use of CNG.
- Tax measures designed to phase in a increasing proportion of CNG fueled vehicles in private and government vehicle fleets and to discourage the import of vehicles that do not comply with measure 5
- Salary packaging schemes to encourage cycling and public transport and discourage car travel, car parking and car ownership.
- Environmentally responsible taxation of workplace parking spaces to give car commuters an incentive to use other modes (Boyd 1998),
- Fund research into the scope for effective coordination and harmonisation of both the provision and pricing of paid car parking and controlling the provision of public and private parking facilities so as to constrain unnecessary car use.Make the provision of

secure bicycle parking mandatory in all new buildings and whenever a building changes ownership that the building is retrofitted with secure bicycle parking.

- Public transport should be GST free Secure bicycle parking should have priority over car parking at rail stations Public transport should provide for the carriage of bicycles where ever possible.Except for for urban end of line stations existing railway car parks should be converted to high density Urban Village developments.
- Encourage employers to reduce travel reimbursement costs for driving on work business and provide remibursemant for cycling on work business
- Urban consolidation should be reinforced by a policy of business location that prevents "employment intensive developments in areas not well served by public transport.
- Urban consolidation regulations and forms of car and house ownership should be reinvented so as to encourage car free housing That is new sub-divisions where no car parking is allowed by the choice of future residents who choose not to own a car but use car sharing clubs (see measure 12 "Call-a Car) when they need to but use sustainable tranport most of the time

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