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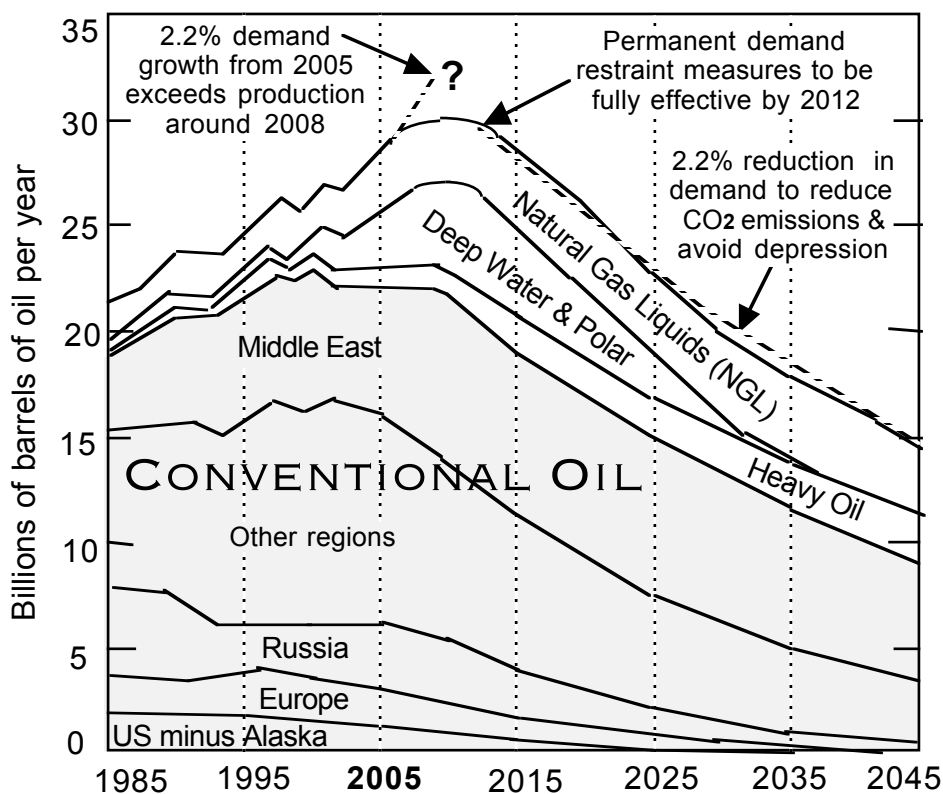
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Making the Right Choices: Options for Managing Transport Congestion

Victorian Efficiency & Competition Commission Draft Report April 2006

Submission by Alan Parker Design

20-5-06



Source: Oil production data from the April 2005 newsletter of the Association for the Study of Peak Oil www.asponews.org

Figure 1

Making the Right Choices Options for Managing Transport Congestion

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Purpose of this submission

This submission focuses on the liquid fuel energy sector and the failure of the Strategy “Melbourne 2030” to confront a future liquid fuel crisis that current research shows will happen within the next 20 years and well within the 2030 timeframe.

The Congestion Draft Report April 2006 states in a footnote by the commissioners on page 263, that:-

Congestion is not specified as an objective in transport legislation, but it seems appropriate that economic efficiency should be the objective, with excessive congestion evidence that efficiency has not been achieved. The time and location specific nature of congestion prevents meaningful broad targets. Moreover, specifying reduced congestion as an objective could encourage the pursuit of lower congestion irrespective of cost. A better objective is to enhance the efficient use of and investment in transport systems.”

The above objective is indeed a little better but it fails to take into account the new research showing that the growing demand for more car based mobility is unsustainable and that a “fail safe” Energy Security Plan is urgently needed to reduce growing oil dependency. This is growing at such a rate that it is a threat to Australian national security and it will occur within the “Melbourne 2030” time frame. The costs of congestion and its affect on our urban lives is inevitable after building an easy-motoring utopia of sprawling suburbs that make incessant driving unavoidable.

While it is true that Australia is an energy rich country with the potential to replace oil, or to make synthetic oil from other domestically available fuels in the long term, the forecast decline in domestic oil production within the next decade means that we will have to treble our imports of oil at a time when the price of a barrel of crude oil will be much higher than it is today. Yet the Victorian government fail to register the basic facts of the world oil situation and Australia’s declining self sufficiency in oil which has been predictable for decades. The purpose of this submission is argue that increasing fuel prices and risk of future oil shortages need to be factored into assessing the economic viability of the practical options to reduce road congestion.

Introducing the concept of peak oil

The graph on page 1 shows the peaking of world conventional oil production which is occurring at the same time frame as the decline in Australian oil production. Australian oil production has also peaked. In fact all oil fields follow a simple pattern of production and depletion along a bell curve. Universally, when an oil field gets close to half the amount of oil it originally possessed, production peaks and then declines. This is true for all oil fields in the aggregate, for a nation and even for the world.

There is convincing evidence that we are near world peak oil production. The collective nations of the earth will not make up for this by importing oil from other planets. Nor does the earth have a creamy nougat center of oil as a few cranky economists think; the reality is that oil fields do not replenish themselves. Also, contrary to the prevailing wishful thinking, no combination of alternative fuels will allow us to, continue with multi-car households, growing road congestion and monster supermarkets in ugly masses of parked cars. Not to mention the

food, commodities and products produced and transported over vast distances that are subsidised by a grossly under priced fuel thereby wasting the oil that future generations will need for more essential purposes.

1. The prospect for more geopolitical friction over oil is going to increase, as industrial nations desperately manoeuvre for supplies. The civil wars in Iraq and Afghanistan are clear evidence of that and demonstrate that there are no simplistic military solutions to controlling the remaining worlds oil reserves. US neo conservative fantasies about invading Iran in recent years will vanish in the fullness of time as increasing oil prices threaten domestic economic stability.

In Australia, the danger lies in the resulting instability of the super-sized oil dependent complex systems that our cities are locked into and which we depend on daily. Oil shortages will create huge problems with how we grow our food, how we conduct trade, how we move around, live breath and recreate. In response, one would think that the national leadership in politics, business and science would prepare the public for substantial necessary changes in the way we do things. Not so. What we are seeing is merely a desperate wish to keep the cars running by any conceivable means, at all costs. That is the hidden agenda of Melbourne 2030 but hopefully will be absent in the Final Congestion Report.

Government agencies who refuse to negotiate with the circumstances that the world throws at them automatically get assigned a new negotiating partner: reality. Reality then requires them to change their behaviour, whether they like it or not. With global oil production peaking we are now subject to rising oil prices as markets are forced to contend with allocating a resource heading in the direction of scarcity. The rate and magnitude of the decline in domestic oil production and the failure to find major new oil fields means that conserving domestic oil supplies and greatly reducing the demand for oil is not feasible in the time available. To make matters worse, Australia is the only member of the International Energy Agency which does not maintain 90 days' worth of oil imports. The Victorian government has failed to pressure the federal government about that and raise the issue in Melbourne 2030.

Australia has been largely self sufficient for 35 years and this has induced a complacent and dangerous attitude to future uncertainties about future oil supplies from the world's most politically unstable countries in the Middle East. The Australian bureaucracy and political leadership has failed to understand that Peak Oil is the point at which maximum global production is reached. It is not an energy crisis, but a liquid fuels crisis and a potential economic, political and social crisis. The truth is that all oil fields peak, all oil regions peak, and the really big oil fields got discovered in the middle of the last century. The low hanging fruit- that is, the light sweet crude- was mostly picked a long time ago and the world is now refining the heavy, sour oils at the bottom of the world barrel that are very costly to extract and refine.

1. The predicted massive increase in tourists flying to and from Australia in the next 30 years by the Department of Infrastructure will be wiped out because there is no substitute for jet fuel and prices are rising rapidly. Another casualty is the use of jumbo freight jets to export fresh Australian produce that is out of season to Asia. Both passenger and freight, air travel will waste away as jet fuel prices climb, simply because fuel is the airlines biggest operating expense. However, the predictions of air industry leaders show air passenger travel growing by some 5 percent a year for the next decade or so. There is no understanding that cheap airfares are producing huge increases in carbon dioxide emissions from jet engines which will be reduced when most airlines bankrupt themselves.

The energy security issue of peak oil was ignored in the Draft Congestion Report which assumed that addressing peak oil and its disastrous economic consequences is not a stated Melbourne 2030 policy objective and can be ignored. Why is that when the impact of road congestion is to waste oil resources? That assumption is wrong because the objective of achieving sustainable economic development is a primary objective and that cannot be achieved without planned adjustment to future oil shortages within the 2030 timeframe.

This submission argues that defining congestion in a way that ignores the coming liquid fuel crisis, as is done in the Draft Congestion Report is irrelevant and will not cope with an uncertain future. A better way of dealing with congestion is within the context of an energy security plan to enhance the efficient use and investment in transport systems that are not oil dependent and to constrain the use and investment in oil based transport systems”

Providing Victoria with a transport strategy that will provide energy security

The Victorian Government should recognise that research published in 2005 and 2006 shows that reducing oil dependence on both the supply and demand sides by the world's major oil consumers must be initiated more than 20 years in advance of oil peaking to avoid a global economic meltdown. However, it is likely that oil peaking may occur much earlier than that. Note that the Association for the Study of Peak Oil (ASPO) predicts that oil will peak around 2010 and states that oil peaking is a risk management problem of global proportions that is not being addressed by governments.

There is a degree of uncertainty about when peak oil will occur and the crucial issue is whether there enough time left to adjust to peak oil. According to a US Department of Energy report there are three possible outcomes from world oil production peaking within the 2030 timeframe. (Hirsch 2005)

1. In the bleakest outcome peak oil occurs between 2008 and 2012 inducing a world wide depression, collapsing world food production, and wrecking the Australian economy. As urban economies collapse business can no longer afford to move goods and people. People struggle to survive in increasingly isolated outer urban communities that have to learn to become self-sufficient, with most journeys made by bicycle, on foot or by limited public transport services.
2. If oil peaks between 2015 and 2025 a less painful adaptation is possible; provided that most developed nations agree to reduce oil dependence with strong government market intervention, including the introduction of fuel rationing and fuel efficiency standards. Some of these measures enabled the US and the UK to survive World War 2 however none of these measures are being currently applied or developed with significant funding.
3. If oil peaks after 2025 a timely adaptation with mutually agreed supply and demand side oil conservation measures as recommended by the International Energy Agency (IEA) will be feasible. Sadly this optimistic scenario envisages that alternatives to conventional oil are available in abundance, allowing the present trend towards greater globalisation to continue apace. This outcome is far from certain and assumes that non-conventional oil can be produced from shale and tar sands without large increases in greenhouse gas emissions, or from coal or gas using unproved carbon sequestration and other technologies yet to be developed. Like President Bush's "Hydrogen economy" this outcome is most uncertain and carries within it a very high risk of escalating greenhouse gas emissions that will destabilise the climate.

Consideration of the above 3 scenarios on the timing of world oil production peaking (Hirsch 2005), show the 20 year lead time needed to adapt to future oil shortages is even more critical. Indeed, a risk management approach would suggests that while one may hope for scenario 3, the prudent thing is to plan to cope with scenario 1 which is the bleakest. This means that options for enhancing the efficient use of and investment in transport systems that are not oil dependent and greatly reducing road based congestion are more likely to be effective and that there is a need to have Plan B as a risk management strategy.

The US Department of Energy report (Hirsch 2005) *reached ten major conclusions:*

1. *World oil peaking is going to happen*
2. *Oil peaking could cost the US economy dearly*
3. *Oil peaking presents a unique challenge*
4. *The problem is liquid fuels*
5. *Mitigation efforts will require substantial time*
6. *Both supply and demand will require attention*
7. *It is a matter of risk management*
8. *Government intervention will be required*
9. *Economic upheaval is not inevitable*

These same conclusions also apply to Australia and Victoria but there is nothing in the Draft Congestion Report relating to items 1 to 4 and only items 5 ,6 and 8 above are recognised in the Draft. However, the Congestion Report in Section 10.0 Key conclusions states that:-

“Many of the options for addressing Melbourne's congestion problem - and maintaining or advancing its competitive position and attractiveness as place to live - have long lead times. Hence it is important that the causes of transport congestion are understood, and the options for addressing them are fully considered as early as possible. “

Unfortunately it does not spell out the consequences of not addressing these options as early as possible. Is that because the seriousness of future oil shortages has been ignored? The Congestion Report in terms of its original but defective brief has done a good job in spelling out the options clearly, but the problem of peak oil requires a less market driven approach and a high degree of government intervention. The Congestion Report should be reshaped and re-orientated to also address increasing fuel prices.

How DOI failed to address the issue of energy security

It is important to record how DOI failed to address the issue of energy security when it was put to them in the process of producing Melbourne 2030.

In 2001 a DOI management committee responsible for deciding what should be studied in the conduct of “Melbourne 2030” decided to exclude any consideration of oil resource depletion and the peaking of world oil supplies. Dr John Grant who was a member of that committee tabled a letter from a scientist (Bruce Robinson) requesting that the issue of world oil production peaking be seriously considered because it would occur well before 2030 and destroy the Victorian economy if countermeasures were not put in place. That letter was discussed and a decision was made to ignore the oil resources issue.

The Committee had many reasons for ignoring world and domestic conventional oil production peaking and then steadily declining. One reason was that given the limited human resources available to them the Committee was unwilling to take on board another time consuming issue to deal with. Another reason was that most members of the Committee knew little of what was going to happen with oil prices and no one had any understanding of the geological-political issues. And another reason was that it was seen as a Commonwealth responsibility anyway. As the draft “Congestion Report” clearly implies DOI did not have an institutional framework or enough human resources to tackle any plan with a 20 year timeframe let alone the 30 year time frame of Melbourne 2030.

That decision was unfortunate but understandable because in November 2002 when “Melbourne 2030” was released the price of crude oil was only US\$25 a barrel, and Australian government agencies and international oil agencies were predicting that oil would only be around US\$30 a barrel in April 2006 and for many years after. Whatever the reason the

Committee made the wrong decision and oil reached US\$ 75 a barrel in April 2006 with many private sector researchers predicting near future prices well over US\$100 a barrel.

Furthermore, by 2006 there had been no serious reconsideration of this issue by the Department of Infrastructure. The claims by many experienced geologists and energy experts that peak oil was only a few years away are listed below: it appears that their research papers and books have yet to be read by DOI staffers since there is no Plan B.

Table 1. Peak oil forecasts for the period 2006 to around 2020

Peak Oil Forecast	Sources and books.
2006 - 2007	Bakhtari (Iran)"A Middle East View of the Global Oil Situation"
2007 - 2009	Simmons (US) " <i>Twilight in the desert</i> " 2005 John Wiley
After 2007	Skrebowski (UK) " <i>Emerging signs of oil depletion – where reality meets theory</i> " 2005 Editor Petroleum Review,
2008	Campbell (Ireland) "Oil Crisis" 2005 London, Multiscience.
Before 2009	Deffries (US) " <i>Hubberts Peak</i> " 2003 & " <i>Beyond oil</i> " 2005
Before 2010	Goodstein (US) " <i>Out of gas: the end of the age of oil</i> " 2004
After 2010	World Energy Council
2012	Weng (China)
2016	Doug-Westwood (UK) " <i>The world oil supply report 2003-2050</i> " www.dw-1.com ,Email: admin@dw-1.com
After 2020	CERA (US)
Around 2020	Sweden commits to weaning itself off oil by 2020

By 2007 when the 2006 Australian Census data are available for the journey to work the unsustainable growth of drive alone commuting in urban Australia with have increased of fuel consumption, and will then be responsible for around 45% of the costs of urban congestion. If more people are using cars for the journey to work they will use those cars for other trips as well

Meanwhile, the rapid decline in domestic oil production and the reduction in the energy return on energy invested in new oil fields (See Submission 18 Figures 3 and 4 appendix A) has alerted the attention of the Australian Senate. The Senators know that the doubling of the price of oil in the last two years has left Australia with a crude oil trade deficit of \$3.5 billion in 2004-05 and that by 2015 Australian oil production would only provide for 30% of domestic consumption so they proposed to have an Inquiry into future oil supplies and that Inquiry is now in progress. Furthermore, the International Energy Agency is so concerned about disruptions to future oil supplies that Australia is being pressured to create a "strategic reserve of oil" in same way as other members of the IEA.

Bruce Robinson - who is the convener of the Australian Chapter of the Association for the Study of Peak Oil and has also set up several working groups to study the impact of peak oil on different sectors in the Australian economy and - has made submissions to the Senate Inquiry into future oil supplies.(See Senate Inquiry website)

The initial hearings of the Senate Inquiry in Canberra heard evidence about the unreliable predictions of the price of oil by ABARE for 2005 and 2006. Since mid-2002, ABARE has consistently under-predicted the WTI oil prices. The further the predictions go into the future, the greater is the undershoot. This appears to be due to a trend where prices are consistently forecast to remain constant or move downward from the current price. Prices are almost never forecast to rise, even when the dominant trend in actual prices has been upward for some time. It therefore appears that there is an ongoing unwarranted sense of optimism in ABARE regarding the stability of the oil market.

ABARE appears to believe that the “current price” is at some sort of peak, and that it will gently recede. This ideology has apparently not been updated or questioned, despite the last 3 years of consistently rising oil prices. If ABARE and other Australian agencies like the Bureau of Transport and Regional Economics (BTRE) get their information about future oil prices that are so inaccurate for a mere two years ahead it is not surprising that their predictions for 2010 and 2020 are way out. Their information comes from several overseas government agencies that reflect one another's estimates and the International Energy Agency (IEA). See table 42.

The IEA produces a report entitled the “The World Energy Outlook” (IEA 2004 p.47) which concluded that the “prices reached in mid 2004 (around US \$42 Barrel) are unsustainable and market fundamentals will drive them down in the next two years”. Consistent with this view, the IEA expected crude oil to decline to US \$22 by 2006 climbing again to US \$29 by 2030 (BTRE 2005 p. 23).

**Table 2. Oil price forecasts for the period 2010, 2020 and 2030
(US \$2000 per barrel)**

Government or intergovernmental source	2010	2020	2030
International Energy Agency (IEA).	22	26	29
Energy Information Agency (EIA); US Department of Energy.	23	25	
European commission (EC)	28	33	40
Organisation of Petroleum Exporting Countries (OPEC)	19	19	
Institute of Energy Economics Japan (IEEAJ)	24	27	
Centre for Global Energy Studies (GGES)	20	15	

Forecasting future oil prices is not an exact science as is clearly shown on Table 2 which reflects the highly inaccurate projections of mostly government sources and the IEA. However, in 2006 the IEA- as the energy watchdog of the world's biggest economies - changed its view. Claude Mandil, Executive Director of the IEA, has called on the European Commission to set maximum energy consumption standards for electrical equipment such as light bulbs and washing machines. Mr Mandil also stated that .

“ Europe needed to do more to curb its oil and gas demand in light of increasing fears over supply: continuing civil strife in Iraq and Nigeria has already seriously reduced both countries’ oil exports, and the threat of US military action against Iran, the world’s fourth largest oil producer, has driven prices to new records....One of the most important ways to increase energy security is through energy efficiency and the market signals for that are not big enough,”

Mr Mandil also raised fresh concerns about the reliability of supply from Russia, the world's

second biggest oil producer, saying it could fall short of IEA expectations over the next four years.

It should be noted that OPEC has now revised its forward estimates and seeks to stabilise the price of oil at US \$60 barrel. Financial oil investment expert Simmons (See table 1) argues that oil is far too cheap and suggests that a price of US \$182 barrel is needed to achieve a slower oil extraction rate and extend the life of remaining oil supplies for essential purposes.

There is a need in Australia to constrain the demand for oil and road congestion with increasing fuel taxes and bring them in line with OECD average fuel excise rates that are significantly greater than 100%. The increased excise to be used to encourage the use of more fuel efficient vehicles and infrastructure that is not oil dependent.

The need to monitor and set targets for options that target the journey to work

The Congestion Report is very long and contains a collection of obsolete opinions as to the nature and causes of road congestion all of which ignore the decrease in energy return on energy invested in future oil supplies and fail to spell out the importance of deliberately letting road congestion increase to a level high enough to change the behaviour of road users in a way that will reduce the demand for road space and the unsustainable level of oil dependence.

Furthermore, it ignores the most accurate Census data (97% sample size) on the long trips to work from the outer suburbs that are generating a great deal of congestion. In the inner and middle suburbs there is great potential for car trip substitution given restrictions in future oil supplies but in the outer suburbs they do not have that option.

Oil dependence has been generated by the growth of low density urban sprawl in the outer suburbs, particularly those with no fixed rail access or regular and frequent trunk bus services that lock households into multiple car ownership and longer car commutes. Therefore increasing congestion costs are a most useful indicator of increasing household oil dependence and an unsustainable urban economy.

Data produced by VicRoads for metropolitan Melbourne provides us with a simple formula for estimating the high congestion costs of the 13% of all car trips that are commuter trips which is a useful indicator of the growth in oil dependence. This formula, plus or minus a percentage or two, applies to the other capital cities.

Car commutes in 2001 = 13% of all car trips
“ “ “ “ = **33% of distance travelled on main roads**
“ “ “ “ = **40% or more of the cost of congestion.**

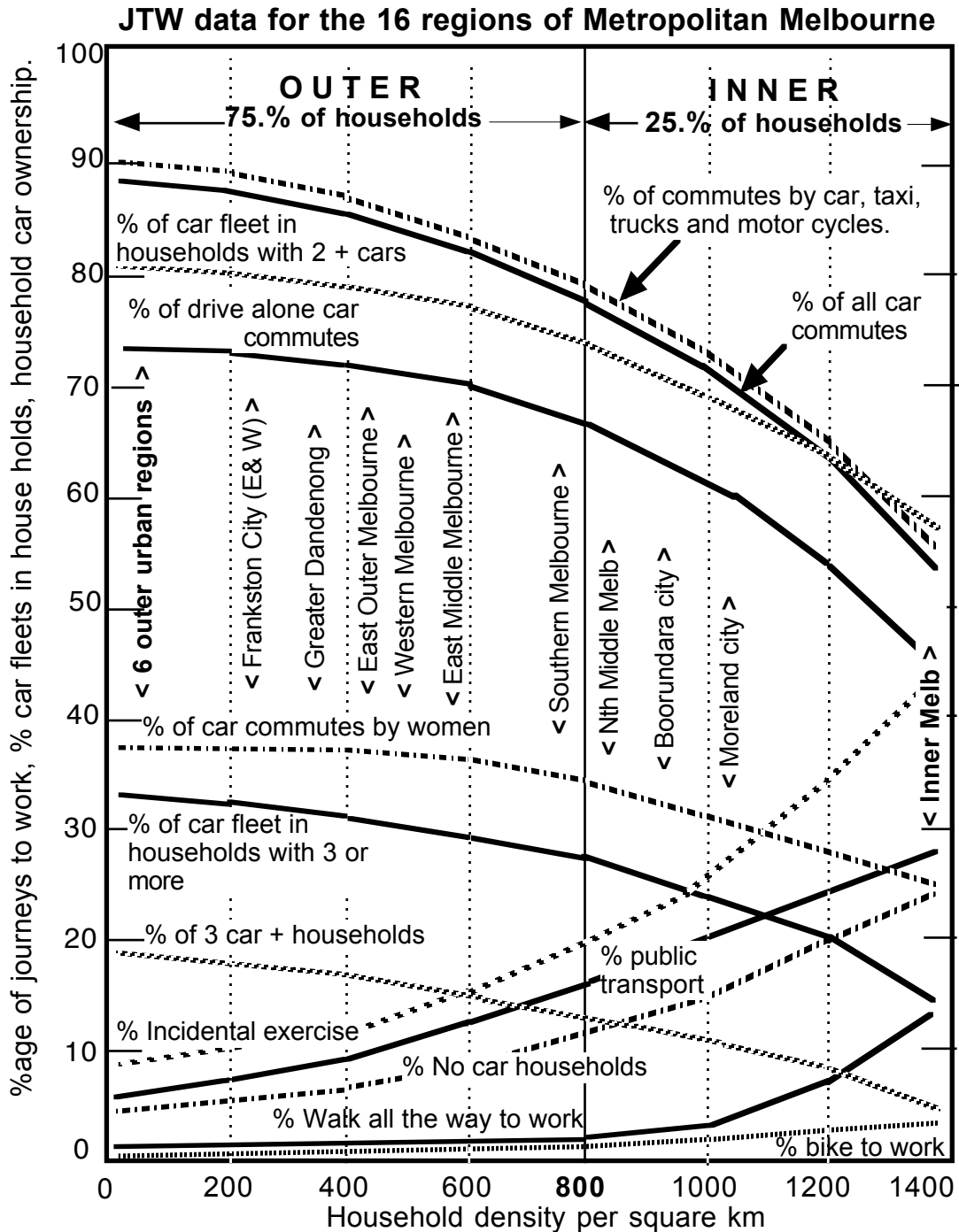
The position paper for this inquiry states that *“around 640 km of Melbourne’s arterial road network is currently congested at peak times and this could more than double to 1300 km of roads by 2021 and the total costs of congestion could be as high as \$2.7 billion per annum”*.

If increasing fuel costs and the cost of carbon dioxide emissions were added that would be a most conservative estimate.

Appendix B in this writer’s original submission (No 18) explains the need to use the census data on urban commutes because of its 97% sample size because it provides accurate data for all transport modes including walking ,cycling and the use of motor cycles and taxis in the outer suburbs from 1976 to 2001, even at local government level.

Note that the 2% sample survey data in the Draft Congestion Report is not accurate when used to measure the minor commuter modes in outer suburbia and provides no data about the growth of intermodal passenger trips in urban areas. .

Figure 2. Melbourne Commutes: 16 urban regions and household density



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 pass commutes. Curves in outer regions have been statistically smoothed.

Most long car commutes originate in Melbourne's outer suburbs

Commutes by all modes are plotted against household density per square kilometre for the 16 statistical regions in Melbourne in 2001 on Figure 2; which shows that there is a most significant difference between the Inner Melbourne Region and the six outermost regions. (See left side data) The dominance of single occupant car commutes and high car ownership levels in outer suburbia is clearly shown.

The percentage of walking, cycling and public transport commutes all decline with household density. The Inner Melbourne Region has a density of 1,300 households per square km, commuting is far less car dependent and 43% of commuters benefit from "incidental exercise" incurred in walking, riding a bike or walking to and from public transport. When petrol becomes expensive most households in this region will be able to dispense with their cars and survive without petrol, as people did from the beginning of World War 2 to around 1950. In a few years when petrol is far less affordable than now, outer urban city dwellers are likely to suffer considerable hardship because 90% of their journeys to work are made by car, truck or motorcycle and there is no easy way of continuing to do that without cheap oil.

Most of the congestion creating long commutes originate in the sprawling outer suburbs which have between 20 and 800 households per square kilometre and where 75% of the population now reside. In these areas 80% of households own 2 or more cars; around 85% of those who are employed commute by car and they are responsible for 85% of the distance travelled by all commuters and for 70% of the drive alone commutes in the metropolis. 78% of the car fleet resides in households with 2 or more cars. Walking, cycling and public transport account for only 13% of all commutes.

With current government policies the growth of the oil dependent transport system will inevitably retard urban economic growth not only in the outer suburbs of the Melbourne. The most recent study of "Oil vulnerability in the Australian city" (Dodson and Sipe 2005) confirms the trends in figure 2 but takes the analysis further by the development of an oil vulnerability index for all municipalities in Melbourne, Sydney and Brisbane metropolitan areas which are mapped and show the most vulnerable outer suburbs. A map of Melbourne highlights the outer urban areas that will suffer the most from the interaction of increased petrol prices, urban transport systems and social geography. (Dodson and Sipe 2005 page 21)

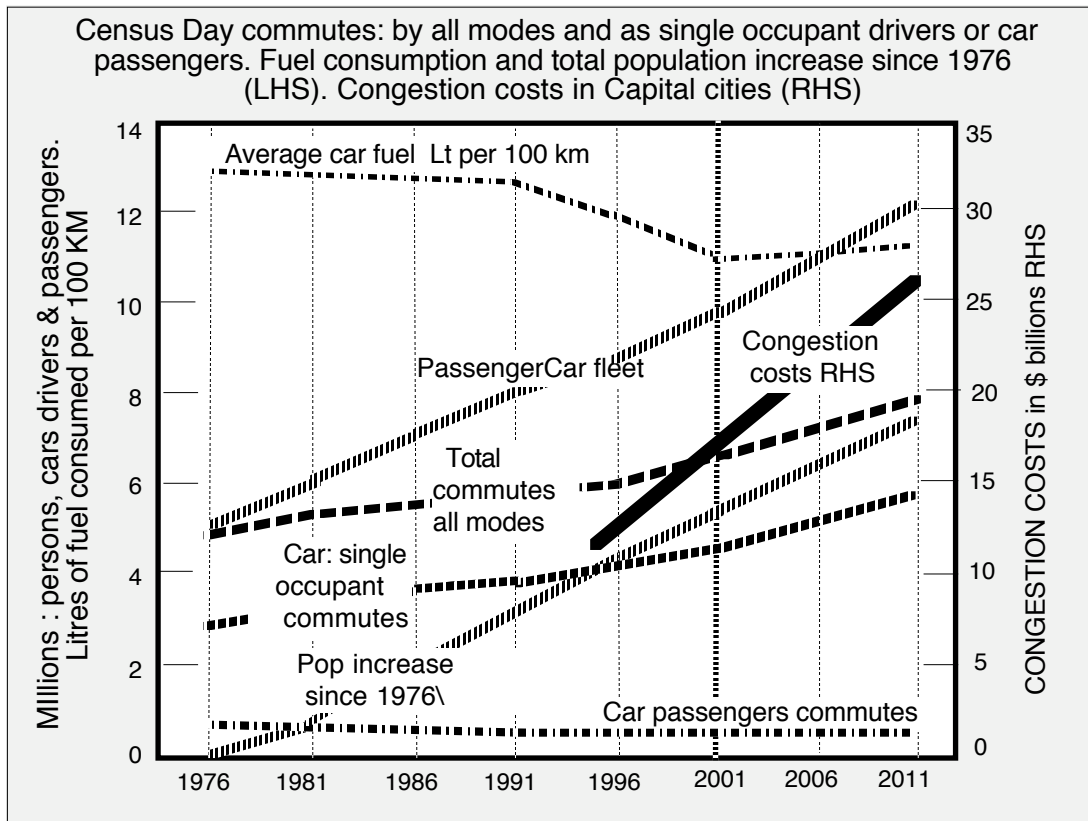
There is a need to comprehend the impact of costlier fuel and to effectively plan well in advance to mitigate inevitable impact of world oil production peaking because 1.46 million Melbournians live in locations that are moderately vulnerable to oil price increases and 350,000 live in very high oil vulnerability locations (Dodson and Sipe 2005 page18)

In 2005 the Victorian Government showed some recognition of the need for a car fleet with smaller and more fuel efficient vehicles. The Minister for Manufacturing, Andre Haermeyer had discussions with Toyota on the need to produce petrol electric hybrid vehicles in Victoria. Toyota has no plans to build hybrids in Australia but they are building them in China and the USA. The Victorian Government will try to turn to coal and gas to synthesise transport liquid fuels and to import oil derived from shale and tar sands. All these alternatives are more expensive and generate far more greenhouse emissions compared to the use of conventional oil. It appears that car mobility may well be maintained at the expense of other parts of the economy and at the expense of making the already disastrous greenhouse issue even worse. Indeed, hybrid vehicles more efficiently use fuel for "stop,start" driving conditions on congested roads

If reduced oil use and greenhouse gas emissions are taken into account from driving and the manufacture and maintenance of cars and the roads they use we can see the following benefits of higher density in the inner suburbs. (Perkins and Hamnet 2005)

- Travelling fewer kms with less fuel consumption.
- Having more fuel efficient cars
- Having smaller cars requiring less energy to manufacture them.
- Having a lower household car ownership with far fewer households with 2 , 3, or 4 cars and requiring far less energy to manufacture cars per household.

Figure 3 Unsustainable commutes 1976 to 2011



The Census data on figure 3 show that the cost of congestion in Australian capital cities is primarily created by commuters who use vehicles, designed to efficiently carry three, four or five people, to drive alone to work. The problem is not the modern car but the planners and their political masters who have failed to make best use of it and to encourage the purchase of new fuel efficient vehicles and cars sharing schemes for the larger cars in the existing car fleet.

Priority needs to be given to developing less oil dependent urban activity centres in the outer suburbs which are the most vulnerable to increases in petrol prices and disruptions to oil supplies. In determining the funding of less oil dependent transport systems and land use planning measures the most vulnerable Melbourne suburbs must receive priority.

The underlying cause of the growth in oil dependence is the absence of a plan for ecologically sustainable transport that guarantees the growth of market share for the more sustainable modes of transport in the existing and new urban areas.

Table 3 is focussed on sustainable commuting modes in the capital cities, including Darwin and Canberra, selected Melbourne metropolitan regions and four Victorian provincial cities.

The commuter market share of public transport, walking, bicycling and car passenger commutes are all ranked by the level of incidental exercise involved in commuting. The level of incidental exercise which is conservatively estimated by adding the percentages of walking and cycling commutes (all the way to work) to the percentage of public transport commutes. When accounting for the costs of oil dependence it would be wise take into account the health costs of decreasing levels of incidental exercise.

Table 3 Percentage of 2001 Sustainable Commutes in all the capital cities and selected Victorian cities ranked by the total level of incidental exercise

Sustainable commutes: Australia, Capital Cities, selected City Regions & 4 Victorian provincial cities	% Incidental exercise	households per sq.km	% of households with No cars	% cycle trips all the way to work	Ratio of male to female cyclists	% of walk trips all the way to work	% of all Public transit. 1,2 & 3 modes	% of car passengers
Inner Melbourne Region #	43.2	1351	24.4	3.4	1.7	12.4	27.5	4.4
Metropolitan Sydney	26.6	118	14.2	0.6	3.8	4.5	21.4	6.6
Moreland City region	26.1	1027	16.2	2.6	1.6	2.6	21	6
Boorundara City Region	23.3	956	9.8	1.3	3.4	3	19	4.5
Metropolitan Brisbane	17.4	129	10.4	1.1	4.2	3	13.1	8
Metropolitan Melbourne	17.2	161	10.2	1	2.5	2.9	13.2	6.1
Australia: all urban & rural	16.8	1.1	10.7	1.2	3.2	4.7	11	7.6
Greater Hobart	14.2	56	11.8	1	3.5	7.1	6.1	9.3
Canberra	13.3	142	7.7	2.3	2.5	4.2	6.8	9.4
Darwin	13.2	12	9.9	3.7	2.1	5.7	3.8	9.9
Metropolitan Perth	13.1	95	8.3	1.1	3.5	2.2	9.8	6.9
Metropolitan Adelaide	12.9	235	11.4	1.2	3.7	2.6	9.1	7.1
Greater Dandenong Reg	12	336	11.8	0.6	7.9	1.9	9.5	8.7
Greater Geelong (Victoria)	10.7	152	10.4	1.5	5.3	3.4	5.8	7.8
Melton & Wyndam Region	10.2	42	5	0.3	4.3	1.6	8.2	7.8
Mildura Rural City (Victoria)	9.4	34	9.1	1.2	3	6.3	1.9	8.5
Frankston City Region	9.1	323	9.2	0.5	2.8	1.6	7	7.2
Greater Bendigo City (Vic)	8.5	59	10	1.8	5.3	4.9	2	8.6
Ballarat City (Victoria)	8.4	41	10	1.5	7.5	4.5	2.5	7.5
Mornington Peninsula Rg	8	68	7.1	0.6	4	3.9	3.6	6.7
Sth East Outer Melb Reg	7.8	43	4.5	0.3	4.9	1.6	6	7

Notes: # Inner Melb. Region = City's of Melbourne, Yarra, Port Phillip & West Stonningham. Male to female ratio = % of male bicycle commutes divided by % female bicycle commutes

Incidental exercise has greatly declined since petrol ceased to be rationed in Australia. Using commuter data for the year 1951 (Manning 1984), incidental exercise was estimated to be 50.3 % of all commutes in Melbourne. By 1981, incidental exercise had dropped to 27.1% and dropped again to 17.2% by 2001. In the 1950s it is likely that high levels of incidental exercise were the norm in all Australia cities.

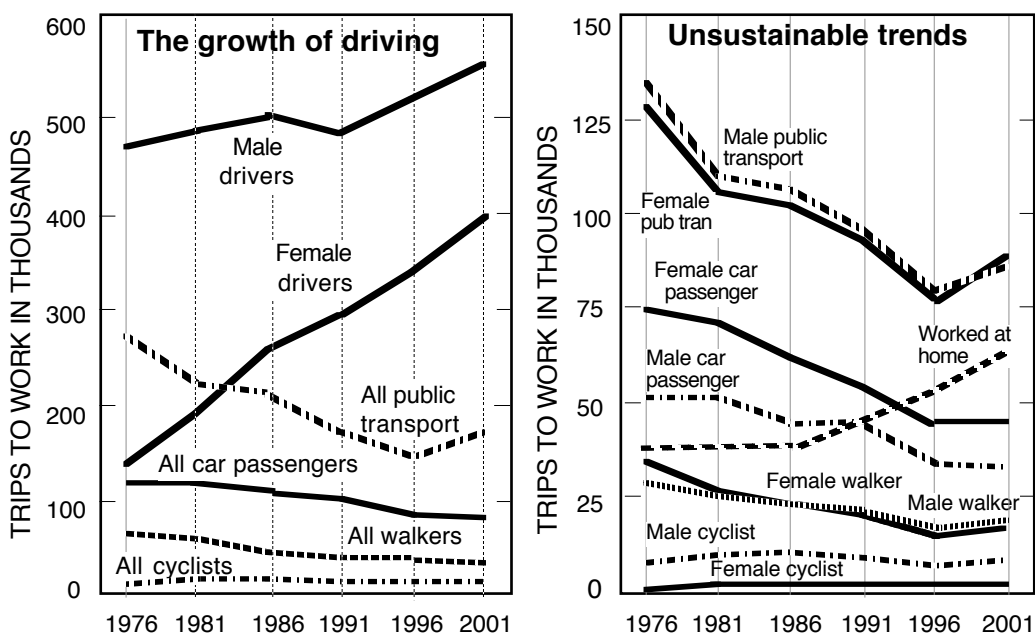
Monitoring and setting targets for the journey to school

There is also a need to take into account the independent trips on foot or by bicycle by children 7 to 17 years of age whose need for safe physical mobility has been neglected in the past and who have become increasingly car dependent and, according to ABS surveys, fatter as consequence. Some state indicators address this issue and the child chauffeuring role of parents but the data for outer suburbia is not very reliable for monitoring change.

Monitoring and setting targets for pedestrian and bicycle use in Australia and Victoria needs to be measured in km of distance travelled for a whole range of journeys as it is in the Netherlands and Denmark. The risk of accidents is a major deterrent to walking and cycling but the only time the Australian walking and cycling death rate per 100 million passenger km was measured was in 1985. (INSTAT 1986) By this measure walking was 5.6 times safer and bicycling was 2.2 times safer in the Netherlands than in Australia in 1985. Also we know that in the Netherlands the walking death rate had nearly halved by 1996 to 2.0 and the bicycling death rate was down 30% to 1.9 (Wellemen 1999)

The claim by road safety authorities that walking is getting safer because fewer pedestrians are killed is spurious because the real reduction comes from the fact that pedestrians are walking far less than they used to. Indeed we know that in outer suburbia that the proportion of people walking to work is far less now than it was 20 years ago. (See Figures 4) Until a thorough job is done to monitor the distance travelled for other walking journeys no one will know for sure. Obviously accident analysts need facts, so it would be prudent for the Australian Transport Safety Bureau to collect the data on a regular basis, just as the Dutch do. It is useful, in transport to do practical things like benchmarking the increase in active transport, but also for public health departments and the environment agencies who want to encourage walking and cycling. The absence of sound benchmark data has for many years deprived community advocates of walking and cycling with the means to make their case and it will handicap the implementation of a active transport options in the Draft congestion report unless these data are provided.

Figure 4 Melbourne work trips 1976 to 2001



The missing option for increasing inter modal passenger transport to replace many long urban commuter trips.

The diverse range of dual and triple mode trips involving more than 750 persons in Melbourne (shown in Table 4) is not so different from other cities with suburban rail systems. Melbourne also has a 300 km tram network and there are 11,650 multi mode commutes involving trams. Since 1976 the use of cars to access Melbourne trains has increased to 25,400. There are 17,810 commutes involving buses used with other modes. Only 1,032 bicycles were used by commuters to access stations because of the high level of bicycle theft from stations since 1976 and increasing vandalism of bikes since since the late 1980s. Free car parks subsidise car use and encourage household multiple car ownership. Future free vehicle parking at stations should focus on providing parking for shared cars, cars for the disabled, bicycles, electric bicycles, and scooters. The able bodied drivers of single occupant cars should pay for their parking.

Table 4 Melbourne dual and triple mode commutes
Source ABS Census "Classification counts" 2001

Dual mode only	Number	%	Dual and triple mode	Number	%
Car driver / train.	18616	1.4	Train / bus / tram	2737	0.2
Bus / train	9425	0.7	Train / bus / car pass	1165	0.1
Tram / train	8919	0.7	Train / bicycle	1032	0.1
Car passenger / train	5623	0.4	Bus / car driver	993	
Car driver/car passenger	2617	0.2	Truck / car driver	831	
Bus / train	2091	0.2	Bicycle / car driver	786	
Bus / car passenger	1401	0.1	TOTAL Dual/triple mode	62060	4.3

Travelling with a bicycle on the train out of peak hours in the other direction to the peak hour flow is no problem. However, travelling with the flow on congested peak hour trains will be more troublesome for other rail patrons than it is now as oil prices increase bicycle parking at stations that is safe from vandals and secure from bike thieves is absolutely essential. In most low density outer suburbs stations and express bus stops are too far away to walk to, too time consuming to access by local bus and bicycle access is mostly on high speed main roads. So it is important to provide more safe bike routes as well as providing secure theft and vandal proof storage for bicycles at rail stations and at express bus stops (Gardiner 1993). In Brisbane a good start has been made with 1,800 bicycles lockers in use at stations in 2003 and several hundred more lockers being installed in 2004 and 2005. Several hundred bicycle lockers are being provided in 2004 and 2005 on rail systems in Perth, Adelaide, Sydney and Melbourne.(Parker 2002)

Table 5 Station catchment area data for walking & cycling with the same physical effort of 75 watts for 7.6 minutes, within a rectangular street grid

	Walking	Mountain bike	Racing bike
Effort advantage	1	3.1	3.8
Speed km/hour	6.1	20	23
Distance km.	0.8	2.5	3
Catchment area sq km	1.3	12.4	19

Table 5 shows that, 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 an area ten times as

large as the pedestrian catchment. Cycling 2 to 3 kms will increase the rail corridor catchment area 4 to 10 times compared to walking; four times for closely spaced stations and 10 times for widely spaced stations. Only 12 % of the population of Metropolitan Melbourne is within easy walking distance of a station but around 70% are within easy cycling distance (Parker 2002). The bicycle and the power assisted electric bicycle will be most important for the elderly to access stations as they reduce the effort required to cycle by 50%.

If a bicycle is used at both ends of a rail trip, as happens with 25% of the bike/rail commutes in the Netherlands, the rail system not only provides convenient access to the CBD but to most of the inner suburbs within 10 km of the CBD and to suburbs within two to three km of the radiating rail lines. (ECMT 2001). Japan has the most developed and sophisticated rail system in the world with around 5,500,000 cyclists parking their bicycles at rail and bus stations on their journey to work school or university (Replogle 1992).

In Metropolitan Melbourne 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 a new express bus network.(Austroads 2002). If there was secure bicycle parking and if the rail system was extended into outer urban areas the potential of the existing rail system would be around 50,000 bike rail commuters. With new express bus services running around the extended radiating rail routes the potential for bike/rail travel would be well over 100,000 commutes per day.

It is suggested that one of the Commissioners take a trip to the Netherlands and travel around the country without a car by using the train and hiring bicycles from rail stations. This writer has done that and seen what can be accomplished by a government that takes environmental planning seriously.

SWEDISH GOVERNMENT EMBRACES PEAK OIL By Lars Olofsson
Published on Saturday, December 17, 2005 by Energy Bulletin.

The Swedish Prime Minister, Göran Persson, has founded a non-political committee with the intent of making Sweden fossil fuel-independent by 2020. The committee will study and propose measures and mitigation over the next six months, and will present their findings and suggestions this summer. A speech the Prime Minister stating that we are about to experience the oil peak and so need to assess measures to mitigate its effects and to transform society to adapt to this, including looking on how transport and car use will look in the future.

Today Sweden gets almost all of it's electricity from nuclear and hydroelectric power, and mostly relies on fossil fuels only for transport; most of the heating has been converted to electric space heating, biofuels and waste recycling, with a small percentage remains fossil fuelled. A 1980 referendum decided that nuclear power is to be phased out, although this has been severely delayed so far, with the exception of the mothballing of the Barsebäck 1 and 2 reactors. Recently there has been trend in Sweden towards increased sales of flexifuel E85 (ethanol) vehicles and fuel, and there are projects underway increase native production of ethanol and synthetic fuels from forest industry waste.

Material in Swedish may be found at: www.regeringen.se/sb/d/6023/a/53852

December 2005: Sweden is establishing transport and energy indicators and establishing targets to seriously reduce oil dependency.

The Sustainable Cities Report also took evidence regarding the Swedish model setting out environmental objectives in 2004 which was regarded as an example of world best practice. The HOR Standing Committee should note that the Swedish government has now recognised the serious threat to Swedish national security posed by peak oil and has upgraded its approach to achieving sustainability objectives to include severely limiting the use of oil for transport. (See Box below)

It would be prudent for the HOR standing committee to do the same. It should be noted that the price of petrol in Sweden was \$2 a litre in September 2005 and that will most likely be increased and the revenue used to provide better alternative transport services.

Some of the de-congestion options greatly reduce greenhouse gas emissions

In assessing the de-congestion costs of the options proposed in the Draft Congestion Report it is important to factor in the cost of carbon dioxide emissions which are currently being traded in Europe for around A\$40 per tonne. The declining energy return on energy invested in the exploration, extraction, transport and refining of oil over the long life of major infrastructure investments also needs to be factored in. (See submission 18 Appendix A figure 3)

This is necessary because the estimated costs and scale of climate change have greatly increased since 2001 when the "Melbourne 2030" study was initiated. Previous estimates of temperature increases, rises in sea levels and storm damage were far too low. Scientists now believe that 2050 is the "tipping point", when so much damage has been done it can not be corrected unless carbon dioxide emissions fall 60% (below 1990 levels) before 2050. (IPCC 2006)

Global warming is accelerating, according to a report by the world's leading climate scientists. There is now overwhelming evidence to show that the Earth's climate is undergoing dramatic transformation because human activity has increased the concentrations of carbon dioxide, methane and other greenhouse gases to their highest in 650,000 years. It predicts that global average temperatures this century will rise by between 2C and 4.5C as a result of the doubling of carbon dioxide levels caused by man-made emissions. Worse still an additional increase of 1.5C is likely as a result of "positive feedbacks" in the climate resulting from the melting of sea ice, thawing permafrost and the acidification of the oceans (IPCC 2006).

There is widespread evidence of global warming in temperature observations taken at the surface, in the free atmosphere and in the oceans," and it is man made. It is very likely that greenhouse gas forcing has been the dominant cause of the observed global warming over the past 50 years. Since its last report in 2001, the IPCC's working group says it has amassed the following convincing evidence showing that climate change is already happening:-

- * Arctic sea ice has shrunk by 2.7 per cent per decade since 1978 and by 7.4 per cent each decade during the summer months.
- * Five of the six warmest years have occurred in the past five years, with 2005 and 1998 being the two warmest years on record.
- * Global average sea levels rose at a rate of about 2 mm a year between 1961-2003, and by an average of more than 3 mm a year between 1993-2003.
- * Mountain glaciers and polar land ice have in general melted faster than they have formed over the past 40 years.
- * Permafrost temperatures have increased on average and the area covered by seasonally frozen ground has decreased by about 7 per cent over the past 50 years.

Other studies show that given food production the population of the world has been predicted to grow by 1.2% per year from 6.3 billion in 2003 to 8 billion by 2028; or 1.7 billion more mouths to feed in 25 years. However, climate change threatens to increase the number of the world's hungry by reducing the area of land available for farming in developing countries. Sixty-five developing countries, home to half the developing world's population, risk losing about 280 million tonnes of potential cereal production as a result of climate change. This loss would have a value of US\$56 billion, or 16 percent of the agricultural gross domestic product of these countries. Climate change will drastically increase the number of undernourished people, severely hindering progress in combating poverty and food insecurity (FAO 2005).

The synergetic interaction of oil depletion with climate change and other environmental "time bombs" that have been ticking away for many years will result in world food production peaking and then declining at a rapid rate in a few years. Conventional oil production is declining in the same 30-year time frame as increased drought, storm damage and rising sea levels due to global warming; a decline in fresh water availability and quality; increasing salinity and soil loss. All of these environmental problems are beginning to reduce food production (Parker 2005).

Sustainability is a journey that is not possible without oil conservation

Sadly few people understand that nature's gift of oil, a finite source of cheap and energy dense fuel, needs to be conserved. Most of this finite resource of cheap and easily extracted oil (light sweet oil) has already been used and most of the remaining oil (heavy and sour) is being wasted when it needs to be used to power the process of ecologically sustainable development (ESD) which has been defined as:-

To ensure that development meets the needs of the present, without compromising the ability of future generations to meet their own needs. (Bruntland 1987)

Sustainability is a journey to achieve the above and make possible the transition to a age that is powered by sources of renewable energy. The need is to ensure human survival when the cheap oil is not available and the world's population has peaked at around 8 billion people coupled with a modest improvement in the standard of living in the developing world, will double the rate of oil consumption and the demand for oil will accelerate particularly in China and India. As yet we do not even know what proportion of the remaining oil reserves should be held back by oil rationing to boost food production, maintain vital services so as to avoid mass starvation.(Parker 2005)

In all countries there is a need to develop renewable energy resources, new green products and processes (Weizacker and Lovins 1997). There is a need for an international agreement that is actually implemented to conserve oil similar to the one to stop making ozone depleting substances. To develop now, without compromising future generations, governments must be able to use both the carrot and stick to conserve oil.

Sustainability is a journey that will require bridges to be built over the technological and political problems blocking the way from the age of oil to the age of renewables . The technology now exists to collect energy in ways that were impossible a few years ago. It is cheap oil that has powered the growth of industries in the past and is still needed to create the infrastructure for the new clean and renewable energy technology that can substitute for oil. For example, the latest multi megawatt wind turbines produce clean energy but oil is still needed to manufacture the turbine blades, gear boxes and the 70 to 100 metre tower and foundations.

The good oil that remains needs to be conserved so that it can be used sensibly to make things that are really needed by when the oil runs out. Amongst the thousands of products needed the following would require oil to make or build them:-

1. Trillions of solar electric roof tiles.
2. 50 billion new energy efficient electric light bulbs.
3. Five billion bicycles and electric bicycles; durable high quality new designs for transport applications.
4. Three billion "ozone friendly" refrigerator/freezers mostly solar powered.
5. Two billion solar flat plate hot water heaters with a range of backup systems.
6. One billion heat pumps mostly solar powered.
7. One hundred million energy efficient hybrid trucks and hybrid buses.
8. Ten million medium and large wind power generators.
9. Five million small hydroelectric power plants for rural villages and isolated farms.
10. 4 million light rail vehicles with regenerative braking systems.
11. 100,000 wave power units.
12. One thousand computer chip and solar cell manufacturing plants worth over \$1 billion each.

There is also a need to revive the use of some old technology, such as the bicycle and horse power that is indirectly solar powered from the foods that are eaten to energise muscles. The threefold mechanical advantage of pedalling over walking enables ten times the area to be accessed by bicycle than on foot and if sustainability is a journey billions will be making trips by bicycle. Sadly this vision of the future will never be realised if national leaders believe that they can complete the sustainability journey in national fleets of SUV's, 4WD's, or even the family car on congested roads.

1. CONCLUSIONS AND RECOMMENDATIONS

2. This submission concludes that a package of decongestion options, designed to assist the process of de-coupling the increased demand for oil from increases in living standards, is an important risk management measure required in the next ten years.
3. Without a serious commitment to reducing the demand for oil on the long journey to a sustainable future the current journey to a distinctly unsustainable future will never be turned around. Reducing congestion via the active constraint of car use and the development of less oil dependent forms of urban development, transport and growth is a necessary part of the sustainable change process.
4. The ABS Census data over 30 years to 2006 is going to show just how difficult it is going to be to reverse current trends. In 2007 the 2006 Census data can be added to Figure 1 which will show what is likely to happen by 2011 if current trends continue for all commuter modes in Melbourne.
5. The absence of data for the distance travelled for walking and cycling trips (except for work trips) means that there is no reliable indicator for active transport in local government areas and this deficiency needs to be rectified if decongestion options are to be evaluated.
6. The projection of transport trends beyond 2006 to 2020 in the Draft Congestion Report are likely to be false and dangerously misleading because oil price increases and possible shortages. The projections in "Melbourne 2030" of transport trends ten years beyond that are totally unreal because by then the Victorian government of the day will have introduced fuel rationing due to serious oil shortages.
7. The Swedish government's sensible risk management approach to cope with the coming peaking of world oil production has much to recommend it. The Victorian government should

encourage the Commonwealth and other states to establish a partnership agreement with the Swedish government and take their advice on all energy issues where their technological superiority is demonstrated.

Unless every country treats oil conservation as almost a national emergency measure the end the Age of cheap oil will create misery and death for at least a billion people because the oil needed to create the alternative energy infrastructure will have been wasted. Most of these deaths will of course occur in the developing nation that support Australian economy by buying Australian minerals and commodities. As the economies of these nations collapse this will produce mass unemployment and social conflict in Australia. Thus, will the sins of the fathers be visited on their children.

Recommendations

The following options for decongestion are recommended to reduce the demand for oil and the increase in greenhouse gas emissions.

- *A Victorian energy security plan be prepared as a matter of urgency. This could be proposed as being the necessary Plan B. The Victorian economy needs to be made far less oil dependent by 2020.*
- *There is a need to comprehend the impact of costlier fuel and to effectively plan well in advance to mitigate inevitable impact of world oil production peaking on the the outer suburbs of Melbourne (Dodson and Sipe 2005). Clearly not enough time is available to produce synthetic oil from coal or gas, produce hydrogen from nuclear energy etc, but there is enough time to greatly increase coal based electric rail passenger and freight transport system and built bikeway networks of finer mesh than the main road system.*
- *Transport options that work on both the supply and demand side of transport markets to reduce oil consumption will be needed and supported by strong regulations. 'Linking Melbourne : Metropolitan Transport Plan' (2004) and its latest reincarnation as "Meeting our Transport Challenges, Connecting Victorian Communities" needs to be reworked to reflect the overriding priority to reduce the demand for oil.*
- *The Commonwealth must be pressured to take action on reducing the tax incentives that encourage car use identified in the Draft Congestion Report and to make the case for a 90 day strategic stockpile of oil that the other IEA members have.*
- *Policy options for expenditure on roads and public transport are assessed at the same time and the appraisal process will take into account progressive and large increases in fuel prices and the impact of oil shortages for extended periods of time in the longer term.*
- *The cost of carbon dioxide emissions also need to be factored in at around A\$40 tonne and account taken off the declining energy return on energy invested in exploring, extracting, transporting and refining oil in large long term infrastructure investments.*
- *We must give priority to starting to rebuild the state passenger and freight rail systems. It would have a significant impact on our oil use. It would put a lot of people to work on something meaningful and beneficial to all Victorians The equipment is lying out there rusting in the rain, waiting to be fixed. We do not have to reinvent anything to do it*
- *The information base for decision making needs to be improved and co-operative arrangements made with other states, such as Western Australia which is taking the peak oil problem seriously.*
- *The institutional arrangements need to be reformed, with particular emphasis on inter*

agency co-operation and on making VicRoads subordinate to DOI and responsible for implementing much of the Victorian energy security plan by reducing the demand for road space and making much better provision for pedestrians, cyclists and road based public transport. The provision of safe bicycle access routes to rail stations has great potential.

• New transport initiatives need to be considered such as intermodal modal passenger transport based on improved bicycle access to rail stations, smart bus stops or express bus systems and the introduction of electric bicycles with solar electric rechargeable batteries, neither of which are seriously considered in the the Draft Congestion Report. See Appendix A (this submission) for an analysis of the electric bicycle industry world wide which is now producing 11 million machines a year and expected to reached 50 million a year by 2015.

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ATTACHMENTS

Appendix A Parker A. A. (2006) Electric power-assisted bicycles reduce oil dependence, road congestion and improve access to public transport