

**Submission
No 4**

ROAD ACCESS PRICING

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Date Received: 5/02/2013

PARLIAMENT OF NSW

COMMITTEE ENQUIRY INTO ROAD TOLLS

SUBMISSION BY JOHN GARDINER

4 FEBRUARY 2013

Introduction

The NSW Legislative Assembly Committee on Transport and Infrastructure has invited submissions in relation to its enquiry into Road Tolls.

This is a topic which has long been of interest to me, both because of my long involvement in transport and tollroads, but also because I see the current financial structures open to government as yesterday's response to tomorrow's problems. We need a paradigm shift in our approach to transport infrastructure. One aspect of the necessary change relates to road pricing.

This paper describes briefly the transport reform crisis we face. It then addresses public perceptions related to road transport and the need to reform those perceptions. The paper then describes the parameters of a solution for road pricing and finishes with a recommended solution.

I have attached a copy of my CV. With over 15 years of experience at the most senior level in tollroads and extensive broad experience in transport reform, I hope that my contribution can be of benefit.

NSW Transport Reform: Where are we heading?

It is good that NSW is at last following the other eastern states with a transport reform master plan. In fact, NSW now has not just one, but two. It is hoped that government will find a way forward once the conflicts between the two plans are resolved. NSW desperately needs progress. Our road arterial links remain a work in progress, with many links missing. Our rail systems serve but a small part of Sydney and the service they provide is of a standard comparable to European cities 50 years ago. Buses do the bulk of the public transport grunt, but also contribute to congestion on the roads.

A city without good transport infrastructure is not a competitive city. We fail to attract new businesses to Sydney because they can be more competitive elsewhere. The city itself is impeded in its growth and, as a result, journeys to work are longer than they should be, more people are injured on roads, our goods and services cost more.

So why is it that two plans put forward (by Transport for NSW and Infrastructure NSW) are so different, one being branded by some as too car-focussed, the other too pre-occupied with a further harbour crossing? The answer seems related to the scale of the problem – we have such a huge backlog of work required. One agency believes that the initial focus should be on roads to gain the most rapid relief; the other believes that we can't wait major reform of rail.

We've been through this before. The much-maligned Sydney Metro project was canned at great expense, not because it was not a worthwhile project for Sydney (it was), but because the

government of the day believed it was losing them votes. The M4 East project has started and stopped many times, again because of uncertainty as to its voters' appeal.

Furthermore, major city infrastructure is becoming vastly more expensive than it was in the past. We The corridors thoughtfully set aside by planners in the first half of last century have almost all been used or sold off by previous governments. At the same time, we are now much more demanding in relation to social and environmental planning. As a result, it seems that every project must involve expensive tunnelling, sometimes increasing costs fivefold (both in capital cost and in operation/maintenance). Yet governments have no way of diverting extra funding to transport infrastructure at the expense of other growing areas of demand such as health and education.

So what should transport reform entail?

Firstly, it requires a change of thinking, by all of us. Let's look at some commonly held fallacies held by the public:

Fallacy 1: We have a right to travel on roads without charges. Roads are regarded as free, but they are not. They are very expensive both to build and to maintain. We pay for them through fuel excise and other taxes as well as tolls and, more worrying, our governments borrow year on year just to maintain our roads and carry out minor improvements. Furthermore, the standard of maintenance of the road networks is deteriorating as maintenance budgets continue to be squeezed.

The fact is, all those citizens who don't own a car, or who use their car rarely, subsidise the rest of us. Yet the costs of road use go far beyond roadworks and maintenance. For instance, there are the costs of road accident trauma, policing and pollution as well. Wouldn't it make more sense if these costs were visible to the motorist rather than hidden? Shouldn't the burden of cost be (at least in part) on those who use the roads?

Furthermore, many in our community object to tolls as some new government grab, but the history of roads (stretching back at least as far as Roman times) has been that road users usually paid tolls. The latter part of the 20th Century is the aberration.

Fallacy 2: We pay too much in taxes for roads to pay tolls as well. The fact is, we don't pay enough and the share is dwindling all the time. Fuel excise is the disappearing tax. As cars become more fuel efficient, the tax generates less and less revenue. In the USA, where "gas tax" has been the major funding source for roads, many roads are falling into extreme disrepair and some have become dangerous.

Even worse, our fuel excise is mostly diverted into consolidated revenue, with only a trickle contributing to road maintenance and upgrade.

With a tax revenue of 26% of GDP, we are a lowly taxed country (21st out of 28 major economies), and, again (as a percentage of GDP) our tax revenue is well below what it was even five years ago. By comparison to many more troubled countries, we are borrowing modestly to pay our national debt, but this still means we are living beyond our means.

Furthermore, this argument could apply equally to public transport. Because public transport has always involved a “toll” (ie fare) plus public subsidy, the community has never made the link.

Fallacy 3: Governments should do something about congestion. Something seems wrong when this argument is put forward on drive-time radio by some motorist stuck in the peak period traffic maul? After all, the motorists on the road at that time are the problem and this caller is one of them. Some of those motorists on the road at that time could have chosen to postpone their trip to a less congested time. If only 3-5% did so, most traffic would flow satisfactorily.

Of course, governments must play a major role in minimising congestion and there is much they can do. The top priorities would be to fill in the missing links in the motorway network – the M4 East (with a link to the M5), the connection between the M2 and F3 – and improve the current bottleneck such as M5 East Tunnel. The solutions are known and plans are afoot.

Yet filling in missing links will not be enough. If we improve the flow of roads, we will still encounter congestion unless motorists accept that we, being part of the problem, need to be part of the solution as well.

Fallacy 4: We don't need to spend more on roads. We should concentrate our spending on public transport. This assertion, frequently heard, is naive. How do we convince motorists to give up the relative comfort of their cars and willingly flock to public transport? That is, if they can get to a station or terminal without using their car, if the trip will as quickly take them from their home to their destination (anywhere in Sydney), if the weather is not wet and miserable on the day, if the traveller is not a tradesperson or courier or freight haulier or parent taking kids to school or mum doing the weekly shopping.

Rail is rightly the preferred choice for commuters heading from points near home to destinations well served by public transport (such as Sydney CBD, North Sydney, Chatswood, Ryde, Parramatta, Strathfield). However, this is a small sample of the daily trips made in Sydney. If governments were, at a whim, able to double the number of trains and double the length of railway lines overnight, Sydney's public transport would reduce the number of trips by road the next day by roughly 10%, providing relief on the roads for a few brief years, yet the cost would be beyond any government's capabilities.

In Melbourne, 80% of all public transport trips are undertaken on roads. Sydney's proportion will be similar, possibly higher. Furthermore, buses make their contribution to congestion on roads, even if they are more efficient carriers of commuters than cars.

(We do need to spend a lot more on public transport. Transport for NSW's reform agenda involving the North West Rail Link, its subsequent extension with a new harbour crossing and lines into the south west and south make a lot of sense. However, this spend needs to be part of an integrated transport reform, also including roads.)

Solutions?

Any solution to transport reform needs to be multi-faceted and involve all stakeholders.

It should have the following objectives:

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1. To provide far greater equity to all travellers than currently exists;
2. To move towards a direct relationship between cost of transport and charges for use;
3. To adequately address the freight task;
4. To provide a financial disincentive to the use of roads during peak periods, but at the same time to ensure that peak period motorists enjoy reliability of travel;
5. To provide real information to all travellers in the community so that they make informed choices; and
6. To provide a reliable mechanism for funding transport reform.

The solution must take into account the psychology of the motorist. How do we encourage the following behaviour?

- Choosing public transport whenever it is a valid option;
- Thinking twice about the time one chooses to travel and avoiding peak periods if possible;
- Thinking twice about using the car as the transport choice;
- Choosing a shorter trip which serves the same purpose (eg shop local);
- Considering jobs closer to home;
- Thinking twice about owning a car as opposed to hiring or sharing or taxis.

I think politicians consistently under-estimate the willingness of the community to assist in problem solving. There are a few successful examples of community responding to a challenge. Perhaps the best response (outside war time) would be the conserving of water during recent shortages. In that case it could be argued that the plea for cooperation was much more powerful than the threat of punishment (though both were arguably required).

Any solution needs also to address the psychology of employers, retailers, freight hauliers and other companies. They can be encouraged to assist with peak spreading on roads. Whilst some companies are already doing their bit, how do we encourage more:

- Staggered working and shopping hours;
- Working from home;
- Home deliveries;
- Deliveries outside peak travel times?

Governments can help industry make these changes through removing legislative blockages and actively encouraging cooperation.

Most people will behave altruistically if they are incentivised to do so. However, without some incentive, good intentions fade away. There exists a phenomenon similar to the so called “tragedy of the commons” at play. The tragedy of the commons related to common land in England. Inevitably, it was argued, common land becomes degraded through over-use because the users don’t trust each other to use the land responsibly. If one takes a conservative approach and others don’t that person loses both the short-term benefit of over-grazing as well as the long term benefit (which he will lose anyway).

In the case of road use during peak periods, the motivation is to blame the government for our abuse. We have no choice, we argue, but to sit here in this congestion since public transport is so

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bad. If the government improved public transport, then those who could use it (not me) would get off the road and everything would be fine.

How would this attitude change if every kilometre travelled during peak periods attracted a charge?

Infrastructure NSW has promoted a “time of day” charge for road users of motorways, similar to that on the Sydney Harbour Bridge. The charge would vary by time of day, being more expensive during peak periods. The concern is that, whilst this may be a good first step along a pathway of reform, it sets up the government for ongoing accusations of broken promises. In order to be effective, the time of day charge must deliver an improved quality of service, acceptable to the motorist. Otherwise, if traffic congestion eases, then once again returns, the extra charge is a “rip-off” – extra money for no benefit. Time of day charges work for a while, then they have to be increased in order to be effective and the increase necessary can well be in excess of inflation.

There is a solution which addresses all the issues and generates revenue for true transport reform. Please refer to the attached paper “TRANSPORT REFORM – A STRAW MAN SOLUTION”, presented to ITS Australia in November 2011. In summary, the solution is as follows:

- Scrap the fuel excise and adjust GST to accommodate the (non-transport) shortfall;
- Change registration for all vehicles to a distance-based charge (which could vary depending upon vehicle weight, emissions and safety features of the vehicle);
- Charge a modest additional per km charge for motorway usage in the cities (where the cost of road usage is so much higher). Existing tolls would be absorbed into the overall charges so the cost per kilometre to travel on all motorways would be the same and, in many cases, lower than existing tolls;
- Apply a dynamically changing additional charge per kilometre for motorway usage during peak periods, this charge being set to guarantee a minimum speed of travel;
- Provide relief for the very poor who are forced to commute large distances from cheap outer suburbs to their place of work;
- All revenue generated from these transportation charges would be predicated to transport reform of road and rail.

Further details are provided in the paper.

Such an approach encourages consideration of options before undertaking any road travel. It further provides a strong incentive not to travel during peak periods. However, it also provides a peak period cost linked to quality of service – effectively a money back guarantee if travel speed and reliability benchmarks are not met.

Furthermore, it would provide far greater equity to motorists than currently exists. Many motorists would pay less than they do now and those who do not use roads or cars would contribute nothing towards their cost.

The proposed solution is posed as a “Straw Man” for discussion. It certainly presents many difficulties. Such reform would require cooperation between State and Federal Governments, never easy to achieve. The State Governments would need to re-negotiate existing PPP concessions. The Cashback scheme would have to go. There will likely be an outcry from motorists who would expect

their cost of travel to escalate dramatically (even though it may not do so and there would follow compensating reductions in cost of living).

However, the benefits are substantial: A real incentive for some motorists to switch to public transport or cycling and to consider the worth of each trip by road; revenue for real transport reform, including expansion of rail, light rail and bus services; assured minimum travel speeds on motorways at all times; reductions (in real terms) in the cost of goods and services; a more dynamic and competitive city.

Two further comments

Technology

The committee should be very wary of recommending technology. There is a long history of governments getting technology wrong . We have at our disposal vast technological resources world-wide, ready to address any problem. Governments should focus on requirements, not technological solutions.

In relation to the solution put forward in the attached paper, though the requirements are complex, there are several technological solutions available now and others on the way.

The committee should avoid picking winners.

Open ended solutions

Governments have a history of providing solutions which rapidly prove to contain further problems. There are many examples in transport. One NSW example relates to some of the early tollroad concessions. At the time, price escalation in excess of CPI seemed reasonable in a high inflation environment. Now these tolls are generating huge inequity for motorists.

A government may choose a road pricing solution in the near future which is deemed appropriate for this time. It may well move us down the path of substantial reform. Care should be taken that the proposed solution does not preclude (or make very difficult) further reform at a later date.

Concluding remarks

I commend the committee on taking this step of public consultation. There does seem to be a enthusiasm Australian governments on getting the issues out there for discussion. This is being underpinned by the transport industry. Roads Australia's hosting of the Transport Reform Network is a good step in the right directions and Infrastructure Partnerships Australia's various papers on this topic have aired many of the issues. IA has hosted industry discussion on these matters as well and the Henry report on taxation reform has also boldly advocated reform . All the major motorist's associations now seem strongly in support.

Let's hope that NSW takes the lead in the next tranche of road transport reform.

John Gardiner

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TRANSPORT REFORM – A STRAW-MAN SOLUTION

John Gardiner

Introduction

This paper follows from earlier papers I have presented on transport pricing reform and further builds on them. The ideas I put forward are my own and are not necessarily those of Queensland Motorways or any organisation with which I am associated.

In the paper I propose a solution - the Straw-Man Solution. I want you to be actively critical of my proposal. That's why I chose the name. Re-shape the Straw-Man if you can.

In order to move forward, we must change our current paradigm in relation to transport pricing. Whilst many in our industry see the need for some form of road pricing, we don't have any public support. Many motorists already regard tollroads as double taxation. Others would die in ditches to fight a charge on freeways. Yet they want congestion and pollution to go away.

I say that until we as motorists acknowledge that everything comes at a price and that we must make choices based on transparent costs, there will be no real change. Commuting by car during peak periods is not a right, it is an expensive luxury and all of us currently pay its cost through our taxes – not only those costs of road construction, operation and maintenance, but also costs of pollution and those hidden costs of death and injury and damage which increase dramatically with congestion.

Look forward 15 years and try to envisage the transport sector. Bear in mind that there will be 25% more cars on the road than now. Bear in mind that the freight task will be approaching double what it is and don't imagine that increased rail freight will bear the bulk of this burden.

What do you see when you look that far ahead?

I envisage road users feeling good about a breakthrough which has already taken place; where there is enough money to undertake real transport reform; where people feel much safer on the roads in safer vehicles that they have been incentivised to acquire; where travel time reliability is something motorists expect as the norm and where an excellent and reliable public transport network is available to all.

What is it we want from road transport?

Set out below is my impression as to how motorists would answer a survey on their preferences.

Table 1: Is this what motorists want?

	Safety	Speed of travel	Reliability of travel time	Low cost	Effective public transport as an option	Need to travel during peak periods
Commuters	Very important	Important	Very important	Very important	Important for many	Very important (but could benefit from more flexible working hours)
Other car users	Very important	Not important	Very important	Very important	Not important for many	Not so important
Professional and trade motorists	Very important	Important in reducing non productive time	Very important	Important, but this group really wants value for money	Not important	Important to maximise productivity
Freight haulers	Very important	Important on long hauls in reducing non productive time – not so important in local deliveries	Very important	Not so important as long as there is value for money	Not important	Important to maximise productivity but could benefit from more flexible access times to delivery points

In relation to less pollution, I would suggest that most motorists would tick the “nice to have” box, but don’t want to pay for it. For better or for worse, pollution is more a concern of society as a whole rather than of most individuals.

In order to gain support from road users for change, we must score well on the table above.

Safety and reliability of travel time are the common features with the strongest support. Lack of reliability primarily arises from congestion and unplanned road closures arising from incidents. Unplanned incidents occur much more frequently during congested times of the day.

Most emphatically, safety is a key issue in winning hearts and minds

As the quality of the safety features of a road improve, injury and mortality rates go down.

Newer motorways are safer than older ones because they address safety more thoroughly (and at greater cost) with better design (in particular: sight lines, merges, carriageway separation, stronger parapets, wire rope barriers, roughness, skid resistance), low speed detection, variable message signs, variable speed signs, lane availability signs, full CCTV surveillance, ramp metering and so on.

The more sophisticated motorways have road injury frequency rates of less than 2 per 100m km travelled, compared to figures 6 times greater on older and less safety-focused motorways and double that again on arterials. It is good to see that Australia is embracing a “Managed Motorway” policy along these lines, at some considerable cost, but how do we accelerate the rate of change?

However, there is a lot of uncertainty regarding the cost of road trauma. We don’t even know how much it costs us year by year. Estimates seem to vary between a massive \$7b a year and an unbelievable \$35b a year. We need to do something about assessment and reporting. What are the costs, economic and social? How do they vary State by State and between different roads? And equally important: if we upgrade a Monash Freeway at some considerable cost, what is the payback? How much does that upgrade actually save in health and insurance and policing and emergency services and victim support and motor vehicle repairs? How many lives have been saved? How many families saved the trauma of caring for a quadriplegic? These issues should be a research priority and the answers should be regularly reported to the community at large .

As many of you appreciate, we are on the verge of being able to implement substantial additional improvements in road safety, generated by vehicle technology and vehicle communications (road to vehicle and vehicle to vehicle). What if no vehicle could run into another? Or inadvertently cross a lane? If no driver could fall asleep, or drive intoxicated? If all drivers had access to first class systems inside their vehicle warning of safety hazards ahead? Whilst motorists get a lot of “mileage” in the media by complaining about speeding fines, excess speed is related to higher incident rates. Why let motorists speed?

The problem with safety is that it costs a lot of money to introduce reform. Where does the initial investment come from? This scheme offers one solution.

A possible future

So let’s look 15 years into the future:

A national plan

This must be a national plan. Any State/Federal differences are not customer friendly. They make life harder for all Australians, be they mums, dads, truckies or tradies. Infrastructure Australia should play a key role in this transport reform and is ideally placed to do so since it controls the Federal purse strings.

Two components to the Straw-Man

There are two linked components to my Straw-Man Solution:

- A national motor vehicle registration scheme; and
- A charge for using motorways in the cities (that is, all urban tollroads and freeways).

In due course, interurban motorways could be brought into the scheme as well.

Component 1: Registering your vehicle

Vehicle registration could continue to be collected by the State road agencies, but a portion would be forwarded to the Federal Government. This portion would replace fuel excise and would be

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based on a per kilometre charge (I call it the **BASE**) which would vary vehicle to vehicle depending on vehicle size, safety inclusions and emissions controls. BASE would be shown on the registration label of the motor vehicle. Based on expected mileage, it could be payable in monthly instalments, with an adjustment at the end of the year.

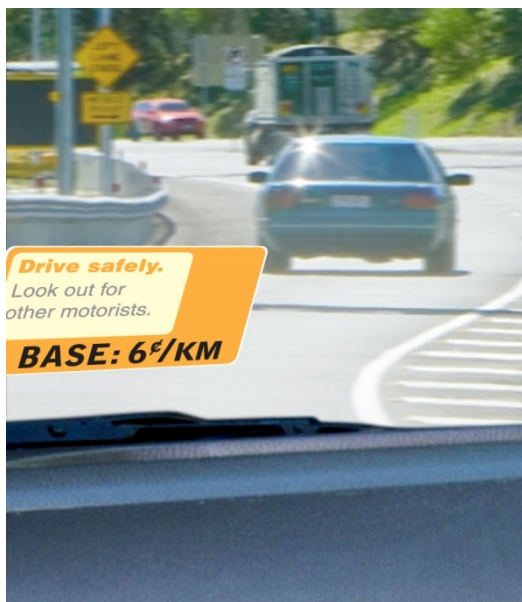


Fig 1: BASE is shown on the registration label of the vehicle

Classifications for Registration

Here is a rough idea of how the BASE for a particular vehicle might be calculated:

Calculation of BASE

	Carbon Emissions	Safety Features	Axles	Registration fee (per km travelled) Base
Basic mid range car	Average	Average	2	7.5c
Adjustments				
Number of axles	- 3 to 4 - more than 4	+60% +120%		
Safety features	- advanced - limited (older vehicle)	-25% +25%		
Carbon emissions	- high - low to nil	+25% -25%		

In this scenario, the BASE for a basic mid-range car would be 7.5c, but could vary between 3.75c/km for a vehicle with advanced safety features and low emissions to 11.25c/km for an older car with high emissions and limited safety features. For a high performance freight mover, the range could vary between 12.75c/km and 20.25c/km.

So the messages motorists would absorb are:

- registration is more expensive for older, less safe, more polluting vehicles;
- larger vehicles such as trucks pay a greater share; and
- the more kilometres travelled, the more you pay.

For comparison, fuel excise for an average car would currently cost around 5c/km.

An even more powerful approach would be to convert part or all of the current State registration and insurance charges to distance-based charges as well. The charges could be set to generate the same revenue for the States but they may result in far more equitable arrangements, with motorists paying more and some less depending on usage. Clearly insurance costs relate well to kilometres travelled, as do the costs of enforcement of registration. This warrants further investigation .

Component 2: City motorways and peak periods

15 years into the future, motorists know that severe congestion and delay on urban motorways is unusual because of a very draconian measure which had been introduced some time before. This measure is the second component of my Straw-Man Solution. I will call it **SAT** – the Safe Arrival on Time charge. It works this way:

When a motorist chooses to use an urban motorway, they pay SAT. SAT is a multiple of BASE. Let's assume the minimum SAT is 3 x BASE. However, SAT increases above its minimum whenever there is risk of congestion and there is no upper limit, so SAT during peak periods may be 4 x BASE or 6 x BASE or more, and will change dynamically at, say, 15 minute intervals over segments of the motorway system. A segment might be roughly 5km.

Fig 2: Roadside signage advising the SAT applicable for motorway segment



Whilst the dynamic SAT is very tough, there is an additional important feature to SAT. It comes with a guarantee. SAT is only payable on any segment of the motorways if the average vehicle speed over

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that segment exceeds a nominated minimum (let's say 60 kph). If there is delay and the average speed falls below 60kph, no SAT is paid.

So motorists receive the following messages:

- *Avoid peak periods if you possibly can (if you are able to, for instance, use public transport);*
- *If you can't avoid peak periods, the extra costs will assure you reliable travel, or your money back; and*
- *Safer, less polluting vehicles pay less.*

What about those areas in our cities where congestion is unavoidable because of missing links - in Sydney, the eastern end of the motorway to nowhere – the M4 – or in Melbourne the eastern end of the Eastern Freeway? The SAT in those areas will, by definition, be zero during peak periods since the 60 kph minimum speed will not be achieved. Travel in those zones of the motorway will be free until such time as the bottlenecks are removed. Luckily for motorists 15 years into the future, this has already happened.

A substantial revenue

So, in summary, there are two Fees: The Base Fee paid as part of registration and the Safe Arrival on Time (SAT) Fee, the latter being dynamic and variable, with no upper limit, charged for travel on motorways.

If the Federal Government abolishes fuel excise, as Dr Henry has suggested, and replaces it with a BASE per km fee which generates the same revenue for government, the same percentage (around 8-10%) could be reverted to the States from consolidated revenue for use on roads, whilst the Federal Government could use the rest, as it currently does, for other things they should be directly taxing. Thus there would be no change in revenue. However, I am advocating that the Federal Government should set parity as applying to a new fleet of safer, low-polluting vehicles and ask all others to pay an extra amount each year (for the average user, an extra \$47 a month). This could generate an extra \$9b a year in revenue and would enable huge transport reform. It would also provide a real boost to the automotive industry.

The SAT fee generated on motorways should be assigned to the city where it is collected. In Sydney, for a SAT of 3 x Base = 22.5c + a dynamic component, 200km of motorways could generate an annual revenue of around \$1.4b a year.

Where would the revenue be spent?

Experience overseas shows that, in order to gain public acceptance, revenue generated from road pricing must be spent on transport. Revenue would therefore be spent on progressively implementing and operating the scheme and;

- Improving and expanding public transport;
- Eliminating the missing links on the motorway systems;
- Upgrading all motorways to current state of the art safety (Managed Motorways);
- Introducing next generation safety measures on roads and in vehicles; and
- Reimbursing the private sector for their investment in road infrastructure.

Remember, all motorways are part of this scheme and all charge the same SAT per km. In Sydney, to maintain a similar return on investment, the diversion to private sector concessionaires would amount to around \$0.7b a year, leaving around \$0.7b a year for the other four measures.

How will the motorist react to Base and SAT?

Would the public accept these charges? Not initially, I'm sure.

However, I argue (and overseas experience indicates) that a scheme like this can become acceptable to the motorists if the following measures form part of the commitment:

- The public needs time to absorb change, so we must accept that a messy debate will be part of the process. IPA and Roads Australia are showing the way, but we need much greater commitment from others. Where are the champions, the brave politicians?
- The campaign should focus on the positives of safety, reliability of travel and pollution reduction, including the savings in community costs (social and economic) resulting from less congestion, pollution and trauma. We need hard facts from reliable sources.
- The campaign should also address current misconceptions such as double taxation and that road travel is "free".

Other benefits should also be part of the message. The Straw-Man Solution (involving BASE and SAT) does the following:

- It provides clear carrots and sticks to motorists, enabling them to make more informed, appropriate decisions. Those who can make appropriate changes will pay less;
- It substantially reduces congestion on motorways and helps reduce congestion on other roads as well since every kilometre you travel on any road increases your costs;
- It generates more revenue which can be directed to eliminating existing road bottlenecks and improve public transport;
- It facilitates substantial improvements in safety with all the associated benefits;
- It reduces the growth in commodity prices due to more efficient delivery of goods and services;
- This in turn results in a more efficient and competitive economy;
- It will help transform our cities because it will help drive greater densification. Denser cities reduce overall travel and facilitate more effective public transport.

As part of the process, we would need to undertake a serious trial in one city to demonstrate the effectiveness of the scheme.

We also need to address the fact that it is often the most disadvantaged in our communities who travel the farthest distances to and from work since these people live in the cheapest suburbs on the fringes of cities and work near the city centres. It may well be that some means-tested support needs to be provided to this relatively small group. Think how much more effective this would be than NSW's cash-back scheme which provides all the wrong incentives.

Ah, but you say, the poor motorist, paying so much more for every trip since every kilometre on motorways is priced. Usually the yardstick in Sydney is how much it will cost to travel from Baulkham Hills to the city, a trip of 30km. Some people make this trip, but not the typical motorist. On the

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existing tollroads where distance-based tolls are applied (Westlink in Sydney, Eastlink in Melbourne – both of which are 40 km long), the average trip is consistently 13 km and 17km respectively. Let’s say conservatively that the average trip incurring SAT would be double that length under this concept since currently freeways are free. There is no reason why this assumption should be so, but let’s take a conservative approach. A motorist in a fuel efficient, safe car could pay around \$4.00 for her trip and the basic mid-range car twice that much.

For most people, distance based charges on a broader motorway network will not radically increase their costs. In some cases, because of inequitable existing tolls, their payments may go down.

Here are the distance based equivalents for the Sydney tollroads (as they were in early 2011):

Tollroad	Length km	Toll \$	Average toll per km \$	Equivalent to Base x
SHBT	4	2.00 (peak 4.00)	0.55	7.33
M1 (Eastern Distributor)	6	5.50	0.92	12.22
M5 South West	22	3.80	0.17	2.30
Westlink M7	40	6.92	0.17	2.31
M2 (Hills Motorway)	21	4.95	0.25	3.14
Lane Cove Tunnel	3.6	2.83	0.78	10.48
Cross City Tunnel	2.1	4.45	2.12	28.25
Total length of existing tollroads	98.7			
Total length of intra-urban motorways	200			

You can see that, for the minimum SAT of 3 x Base, the cost to the motorist would be less in many cases.

Now these comparisons ignore the dynamically increasing SAT which may be applied during peak periods. How much more will be paid by motorists with a dynamic SAT? It is difficult to calculate, but possibly not very much. Furthermore whatever is paid is likely to reduce year by year. Currently in our cities, the major causes of motorway congestion are missing links in the motorway network where average speeds during peak are often well below 60kph. Therefore no SAT will be paid in adjacent segments until the bottleneck is rectified. During peak, maybe 2/3 of the 200km of motorways in Sydney maintain 60kph plus throughout peak periods. Furthermore, small reductions in traffic volumes reduce congestion dramatically – just think of the impact of school holidays on congestion, when reductions can be as small as 3% and traffic flows freely. In many locations we only need a small number of motorists to be diverted to increase average speeds above 60kph. The application of a dynamic SAT will cause that diversion for those who can choose to divert. With time, vehicle numbers will grow so a dynamic SAT will always be necessary, but at the same time missing links will be infilled and public transport will be improved, so these factors will tend to some extent to offset growing numbers.

To further put dynamic SAT in perspective, at 6 x BASE the basic mid-range car would pay an extra \$1.12 for one 5km segment of the motorway. Is that a reasonable price to pay to guarantee 60kph travel?

Another important point is this: the most efficient management strategy occurs when dynamic SAT is lowest at all locations, since this then generates the most efficient use of the overall network. Whilst dynamic SAT may need to have shock value initially, the best traffic flows will result from the lowest SAT at all times.

Technology the servant not the master

At an ITS conference, you may think that I should say something about the technology involved in such a scheme, but I don't intend to do so.

Once we determine the outcome we want, the technology will follow and you are the people to deliver it.

Obviously there is a significant initial cost in developing and rolling out the optimal technology to manage dynamic SAT. In Sydney, with some 200km of motorways, the cost of a system based on average 5km segments may be as high as \$500m, depending upon how smart we are in our innovation. Even at that cost, a payback on investment would occur within 12 months.

Tollroads and the Straw-Man Solution

There is no way that road charges of any kind can be introduced on top of existing tolls. The tollroad concession revenues must be absorbed into the BASE/SAT scheme. To mention just a few reasons for this assertion:

- The costs to motorists would result in huge distortions in current road use (or in other words, chaos);
- The costs would also be too complex for any road user to understand;
- Almost every existing concessionaire would be pursuing damages from government since their traffic flows (and hence revenue streams) would be dramatically affected and their sources of debt could well disappear overnight;
- The sovereign risk associated with any unfair change would ensure that the private sector lost interest in any future Public Private Partnerships.

Therefore governments will have to rewrite the current contractual arrangements with tollroad concessionaires. Whilst these negotiations will be complex and difficult, government will prevail as long as it treats the private concessions fairly. The key considerations would be as follows:

- The return on investment and revenue stream under the new arrangements must be comparable to that under the current concessions;
- The concession length should not vary;
- There will need to be some adjustments for risk as it might be affected by the changes;
- The cost of provision of current tolling services will change;
- Lenders will want assurance regarding risk and debt service provisions.

There is a place for the existing concessionaires in this new world I am describing, together with a desperate need for the private sector to work with governments to accelerate change and increase their investment in transport infrastructure. Governments must set the right example in their

negotiations with the existing concessionaires. Government revenue from road charges should be used more as seed capital, encouraging greater private sector participation and investment.

Interestingly, traffic risk is reduced under a road pricing scheme embracing all motorways since the revenue risk for a particular investment does not have to be derived from that investment footprint alone, but is spread across the network. I think this makes it more attractive for governments to assume traffic risk.

Further customer focussed reform

As part of any transport reform, we should tidy up the flaws in our existing tolling systems.

At the time of implementing a Straw-Man Solution, we should move to a single customer management agency. I believe all the Australian tollroads agree that a single customer interface would be preferred to the current multiple agency environment and would improve customer service and reduce costs. There are issues, however, as to who should own that agency and ACCC has a view as to monopolies.

I envisage a single entity, jointly owned by the States and the road concessionaires (for the life of their concessions), with an independent executive and chairman, with directors appointed by the shareholders. It would charge a fee to collect revenue, the fee being sufficient to cover its development and operating costs and a reasonable profit. Alternatively, this could be a State-owned agency, or a private sector contractor, but I have no doubt that private sector involvement would enhance its efficiency.

Our vehicle classification systems (ie identifying what is a car, a light commercial vehicle, etc) vary state by state and some of them are very difficult to manage with electronic charging. For instance, most open road tolling classification systems infer the number of axles from the footprint of the vehicle. At the same time the offence for failing to pay also varies by state and causes great confusion for tourists, interstate hauliers and of course, considerably increases the workload of the tollroad concessionaires.

As part of such a wide-ranging reform, we should clean up these matters.

Other alternatives?

I suspect there are many different options being considered by state and federal transport agencies at present. That worries me because I'm concerned that Australia will end up with a politically expedient, less than satisfactory solution. Each component of the Straw-Man has advantages and disadvantages. It is worth looking at them one by one:

Components of the Straw-Man Solution

1. Related to BASE:	Pros	Cons
Introduce BASE in place of fuel excise to generate same revenue. Motorists pay for the km they travel	<ul style="list-style-type: none"> -Can be done unilaterally by Feds, but best done by agreement with all States -Gives clear message to motorists to consider driving less -Captures all vehicles using all energy sources whereas revenue from fuel excise will reduce with time 	<ul style="list-style-type: none"> -Fuel excise is a distance-based charge, so why change? -Does nothing to make uses of current fuel excise revenue more transparent -How to collect? Fuel excise is collected by petrol stations. <i>(States could collect for Feds through existing agencies, but requires negotiation and agreement)</i>
Include current State rego and insurance costs in BASE	<ul style="list-style-type: none"> -Strengthens messages above 	<ul style="list-style-type: none"> -May need some fixed cost component -Requires all States + Federal agreement
Increase BASE (from say 5c to 7.5c) to generate additional revenue	<ul style="list-style-type: none"> Revenue can be used for transport reform 	<ul style="list-style-type: none"> Community will object to paying more <i>(additional revenue should be predicated to transport reform)</i>
Skew base to incentivise a move to safer, less polluting vehicles	<ul style="list-style-type: none"> -Means those who drive less safe, higher polluting vehicles pay more for the privilege -Will reduce number of fatalities and injuries, and social and economic costs associated with medical, police, emergency services, motor vehicle repairs, roadway operation and maintenance costs. -Will provide a stimulus to the motor vehicle manufacturing industries 	<ul style="list-style-type: none"> -Makes process more complicated

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2. Related to SAT:	Pros	Cons
Introduce static SAT on all urban motorways in one State	<ul style="list-style-type: none"> -Could be done by one State, but best done by consensus with all States and the Feds -Gives clear message to motorists to consider driving less on motorways -Reinforces the incentive to convert to safer, less polluting vehicles 	<ul style="list-style-type: none"> -“Tolls” freeways -Requires extensive and costly new revenue collection systems (<i>but payback period < 1 year</i>) -Requires a collection agency, but very similar to what tollroads do now -May induce more congestion on arterials and local roads
Ditto, but common system all States	<ul style="list-style-type: none"> -Much more customer friendly, especially for truckies, tourists 	<ul style="list-style-type: none"> -Requires all States to collaborate and agree
Remove tolls on tollroads and charge same SAT as freeways – tollroad revenue to be “kept whole”	<ul style="list-style-type: none"> -More equitable for motorists -Simpler calculations of charges -Avoids major disputes with current concessionaires 	<ul style="list-style-type: none"> -Requires re-writing existing tollroad concessions
Introduce dynamic SAT on motorways in one State	<ul style="list-style-type: none"> -Could be done by one State, but best done by consensus with all States and the Feds -Enables peak period traffic volume control management -Incentivizes motorists to avoid peak periods -Encourages commuting by public transport -Can guarantee travel time with small revenue loss due to incidents 	<ul style="list-style-type: none"> -More complicated systems
Ditto, but common system all States	<ul style="list-style-type: none"> -Much more customer friendly, especially for truckies, tourists 	<ul style="list-style-type: none"> -Requires all States to collaborate and agree
Introduce single agency to collect all road charges	<ul style="list-style-type: none"> Much more customer friendly – one phone number and email address Australia wide, one set T&Cs 	<ul style="list-style-type: none"> -Requires all States to collaborate and agree -ACCC?
All States to agree on: <ul style="list-style-type: none"> -Common classification systems for all vehicles -Common “offence” for not paying SAT 	<ul style="list-style-type: none"> -Much more customer friendly, especially for truckies, tourists -Will reduce collection costs 	<ul style="list-style-type: none"> -Requires all States to collaborate and agree

Conclusion

In this paper I have tried to paint a scenario – the Straw-Man Solution - which might just work. I do not pretend that this is the best and only way. The issues are complicated, and I’m sure the outcome of a move in this direction will look different to the Straw-Man in unexpected ways.

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The Straw Man Solution would dramatically change the way motorists think about road usage. It would enable motorists to make choices about how much they want to pay for enhanced safety, reliability of travel and reduced pollution. If they make the right choices, they will reduce their transport costs. If they don't, that is their choice, but they pay more and thus contribute revenue to the development of an improved transport system.

Whilst selling the concept will not be easy, I believe it can be done if we get the messages right and give the public time to understand the benefits. Improved safety is one message that needs to be pushed hard, but we need better safety metrics and reporting in order to do this. Reliability of travel time is the other key. Limited experience elsewhere shows that a Straw-Man solution may be acceptable to voters provided that the revenue which flows from registration and SAT is predicated to improvements in public transport, safety and filling in "missing links" in the motorway network.

The time to start selling a concept like this is now.

Copies of previous papers on this subject can be obtained via 