

**Submission
No 84**

INQUIRY INTO ROAD TOLLING

Name: Mr Mathew Hounsell

Date received: 28 February 2017

Submission on Road Tolling (20161207)

New South Wales Legislative Council – General Purpose Standing Committee Number 2

From Mathew Hounsell February 2017

Dear Members of the Committee,

I am writing to you regarding your committee's inquiry into road tolling.

There is a broad consensus amongst the economics and transport professionals that a broad road pricing scheme should be and will be introduced. The question is not whether to price some roads in Sydney but how to price all roads simply, efficiently and **equitably**.

The NSW and Commonwealth Parliaments were created to balance the competing interests of stakeholders and now it is only a matter of time before one of these governments institute a broad road pricing mechanism.

Sincerely, Mathew Hounsell
Transport Researcher

Infrastructure NSW recommends Time of Day Pricing in [SIS] on page 91. The Australian Future Tax Review [see Appendix A], and so the Commonwealth Treasury recommend an increase in the use of road pricing; as does the productivity commission, the NRMA, and countless other public and private reviews into Australian Transport. [SIS]

Submission

I would like you to consider that the decreasing cost of electric vehicles will deliver a non-linear reduction in the proportion of internal combustion engines within the nation's vehicle fleet. As such, there will be a commensurate reduction in the revenue collected by the state through fuel excise.

This will leave the state with the choice of a combination of six options to pay for the road network:

- reduce the spending on roads;
- introduce higher network access fees;
- increase access fees for popular roads;
- introduce information technology mediated usage charges;
- raise general taxation;
- and/or transfer spending from everything else to roads.

The fifth and sixth option will be the ones demanded by motoring lobbyists, but those options have the worst side effects on society and the economy. However, raising existing taxes to pay for road spending would be the simplest option.

Perceived price

The terms 'perceived costs' and 'behavioural costs' are sometimes found in transport economics literature referring to the costs that road users perceive and therefore base their decisions on. They equate to generalised costs less costs that transport users do not perceive. For example, car users may not perceive the variable cost components of vehicle depreciation and maintenance. They may not be aware of the connection between speed and fuel consumption (Button 1993, p. 87). Where vehicles are provided by employers for private use, drivers may face no variable costs at all, so the only perceived cost of driving is time.

As it is usual to think of demand as being a function of price rather than cost, the [National Guidelines for Transport System Management in Australia] use the term 'perceived price' rather than 'perceived cost'. [NGTSM] Volume 5

The committee must remember that human are less capable of perceiving incremental charges (like per-km tolls) than single charges (like flat tolls). As such tolling companies prefer incremental charges like distance based tolling because those tolls have little effect on the user's perceived price and thus do not reduce revenue.

Increasing price reduce congestion

Introducing the right type of road pricing system will reduce congestion within our metropolitan areas. This will remove a drain on national productivity and health and free significant amounts of space for more productive uses.

We can see from the numbers that there was a significant surge in the number of vehicles using the Parramatta Rd and M4 corridors when the tolls were removed. In fact there was approximately an extra thousand vehicles in the corridor; on top of those who changed roads. This is why the Commonwealth Treasury, Infrastructure NSW and the Productivity Commission all recommend the introduction of distance based, time-of-day road pricing. [SSI]

	Parra Rd Before	Parra Rd After	Parra Rd Difference	M4 Tolled	M4 Untolled	M4 Difference
AM 06:00 – 10:00	2370	1869	-501	8124	9657	1533
PM 15:00 – 19:00	2820	2511	-309	8243	8979	736

Change In Traffic With M4 Toll Removal - M4 Toll Plaza and Parramatta Road, Silverwater (Appendix D Page 72)

Connected Autonomous Vehicles will have a major impact on our cities. Transport NSW has already identified that if we do not introduce an effective road pricing regime the CAV fleets will grow unconstrained demanding ever more land.

Over 20% of the city's land is devoted to the private car system. Each private car as a Unconnected Manual Vehicle requires eight car parking spaces in the road network to operate. As the CAV fleet grows there will be a reduction in the land required for parking two tonnes of steel. An average car space requires approximately 5 by 3 metres of highly valuable land; 15 square metres is enough space for a small footprint business. More importantly the freed parking spaces can be combined to provide opportunities for other activities. For example, under International Basketball Federation (FIBA) rules, basketball courts measure exactly 28 by 15 metres.

A thriving city will always have congestion because persons choose their mode of transport based on balancing the perceptions of price, duration, safety, comfort, and the reliability of that expected duration. Private cars will remain the most popular mode and **the road network will remain congested while the road network is perceived to be reliable, faster, cheaper or safer.**

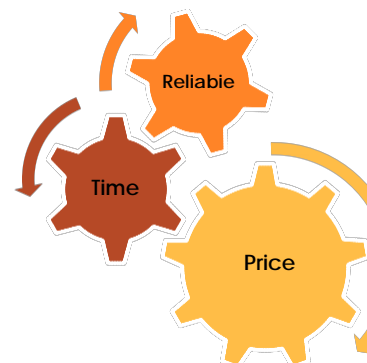


Table 3 Level of Service Criteria – Midblock Sections

Level of service (LOS)	AustRoads Description	Road Section (vehicles per lane per hour)
LOS F	Forced flow. The amount of traffic approaching a point exceeds that which can pass it. Flow break-down occurs, and queuing and delays occur.	900-1700
LOS E	Traffic volumes are close to capacity and there is virtually no freedom to select desired speed and to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause break-downs in operation.	720-1360
LOS D	Approaching unstable flow where all drivers are severely restricted in their freedom to select desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor and small increases in traffic flow will cause operational problems.	585-1105
LOS C	Stable flow but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience has declined noticeably.	450-850
LOS B	Stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is less than LOS A.	Not Applicable
LOS A	Free flow in which drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high and the general level of comfort and convenience is excellent.	

The NSW population has proven that in an unpriced road network they are willing to tolerate reduced speeds and the risk of severe disruption; and that the road network will achieve equilibrium at a Level of Service E. This is extremely undesirable as the state's productivity is hampered by network disruptions and time wasted sitting in traffic.

However, the Bourke St cycle super highway and international experience has shown that users will even transfer to cycling if the reliability of duration and perceived safety of a physically segregated bicycling is better than that previously provided in-traffic gamble.

Charging for the service provided

There is a major flaw in the current structure of road pricing in NSW. Toll roads are paid per vehicle; it is in their interest to increase the number of vehicles to saturate the toll road. However, it is in the states and customers interest that the toll roads remain unsaturated and operate quickly and reliably.

All toll roads in NSW should be transferred to availability payments. That would align the incentives of the toll road operator with the users and the state. There after the toll regime for the motorway should reflect its importance and vary to ensure that the toll road is operated at LOS D or above.

Network Access Charges and User Fees

The state's road network is of limited utility unless it is large and pervasive. Roads degrade over time due to environmental factors like temperature and water damage. The cost of upgrading and maintaining the road network is partly fixed and partly determined by the impact of vehicles causing additional maintenance.

The cost of maintaining the road network at regular intervals should be covered in network access fees. The costs caused by wear and tear should be recovered by usage fees. Usage fees should be differentiated based on the damage possible from the class of vehicle, which is usually proportional to the cube of the axle weight.

Australian governments have built many infrastructure networks: Water, Electricity, Telephone, Tramways, Railways, and Roads. The parliament must consider that water, electricity, and telephone all returned a profit to government. Once established Sydney's Tramways returned a substantial profit until their last day of operation. In contrast the bus replacements have run a continuing increasing loss.

It would be irresponsible of the government to create another monopoly; especially one that implements road pricing. The example of Sydney Airport shows that it very easy to construct a large and very profitable asset management business that charges large fees, massive rents and pays no taxes. Giving a monopoly in road pricing to a private company, like Transurban, would either result in significant overcharging of customers or a constant battle with regulators regarding fixed prices.

Types of road pricing

Boom gate \ Flag fall

Toll roads are ancient and most of the good roads in Medieval Europe were tolled. As the name suggests, when the user reaches the boom gate aligned across the road they are confronted with paying the toll or facing the consequences. The Pymont Bridge was one of NSW first toll roads.

Research by Transurban into future road pricing systems show that up-front or minimum price tolling will be very successful in reducing congestion in NSW cities. That is because the price of this type of flat toll is easily perceived and fully understood by users.

Cordon

A cordon works to reduce congestion if the area is small and has a minimal potential for indigenous traffic. Metropolitan London introduced a price for vehicles entering a large area of central London. This area was surrounded by a cordon of number plate reading video cameras. The impact of this price was to decrease the volume of traffic entering the cordon. However, the response to the increase in available road space was an increase of traffic *within the cordon* and a return congestion to the previous levels.

Macquarie Park CBD, Parramatta CBD, and Sydney CBD are ideal for cordon based road pricing, because they are:

- primarily commercial areas;
- served by high capacity public transport;
- small and have limited connections into the surrounding road network;
- and the land value is sufficiently large to encourage the transfer of land to more productive uses.

Most importantly the three CBD are significant traffic generators. **A small reduction in traffic to those areas would free up much of the cities networks for voters travelling to areas not as well serviced by public transport.**

Parking Levies

Parking levies are one of the simplest and oldest road pricing schemes. They are wide spread and range from on-street parking meters to levies on businesses that provide off-street parking. Parking levies are a network access fee.

Parking rented from a landlord should be opt-in per employee. As another example of perceived price, parking spaces in Macquarie Park were being rented to tenants at over \$2500/year. A person driving to Macquarie Park is allowing a substantial sum of their cost of employment to go to a third party property trust. Sydney University offers on-site parking for its staff at a price of \$300/year and most staff choose other modes of transport; reducing congestion and costs to the University.

Most western jurisdictions have strong local independent governments. However, NSW State Parliament seems obsessed with the minutia of local government and has created a faux governance structure that is utterly ineffective.

The NSW government should encourage local responsibility and allow local governments to levy user pays charges for the facilities they provide. These targets for these levies should include facilities like roads. Many United States cities levy a charge on vehicle ownership to pay for on-street parking and road maintenance.

Per Kilometre

The surface fleet will transition to Connected Vehicles as they will enable the road network to operate more efficiently. For example, traffic lights will know that there is no more oncoming traffic and will be able to cycle immediately to give access to the cross road and pedestrian paths. Connected Vehicles will be ideally suited to charge per-km tolls.

Humans will not be able to accurately estimate the cost of per-km tolls and thus will not reduce congestion. They will also be severely agitated as their toll bills will inevitably be larger than what they expected.

However, **Connected Autonomous Vehicles must be subject to a per-km road price to prevent intolerable congestion** cause by them doing unnecessary trips, circling around looking for customers, or circling to avoiding the cost of parking.

Electric

Electric drive systems are simple and proven technology. They have been deployed in NSW vehicles since 1898. They are simple to manufacture, long lasting and simple to maintain. Electric drive systems have remained functional and used in operation for over fifty years. Modern electric drive systems are incredibly sophisticated and powerful.

Most importantly electric drive systems are less expensive to manufacture and install. The Tesla electric drive system is one unit and installed in a new car in one operation in under five minutes. In contrast an internal combustion drive system has thousands of components, takes many operations and a long period to install, they requires constant expensive maintenance and most wear out quickly.

In addition, internal combustion engines (especially diesel) produce substantial levels of air pollution that in large numbers create dangerous smog. Many cities such as Paris, Madrid, Athens, and Mexico City are moving to ban these vehicles.

The days of the oil powered internal combustion engine are limited. This will trigger a significant and accelerating reduction in fuel excise.

Appendix A: Australia's Future Tax System

The following excerpts are from the federal government's review of the Australian Tax and Transfer System completed in December 2009

Excerpt: Appendix B: The Australia's Future Tax System Review Panel

- Dr Ken Henry AC (Chair), Secretary to the Treasury
- Dr Jeff Harmer, Secretary, Department of Families, Housing, Community Services and Indigenous Affairs
- Professor John Piggott, Professor of Economics and Associate Dean, Research, Australian School of Business, University of New South Wales
- Mrs Heather Ridout, Chief Executive, Australian Industry Group
- Mr Greg Smith, Adjunct Professor, Economic and Social Policy, Australian Catholic University

Excerpt: Chapter 8: Enhancing social and market outcomes

In Australia's future tax system, the only additional taxes to those on the four broad bases described earlier would be specific taxes imposed for one of three purposes: to improve market or social outcomes by addressing spillover costs and benefits; to help counteract self-control problems (in the special case of tobacco); and to improve market efficiency through appropriate price signals. Such taxes would only be used where they are a better means to achieve the desired outcome than other policy instruments. The rate of tax would be set in accordance with the social cost of the activity. Revenue should be a by-product of such taxes, not the reason for them.

User charging would play a complementary role, as a mechanism for signalling the underlying resource cost of publicly provided goods and services and rationing individuals' access to community resources, including renewable resources. User charging can be an efficient means of financing some government-supplied goods and services, provided the user is charged the cost (or loss) that consuming the good or service imposes on others. Where users do not directly impose costs on others, as is the case with public goods, funding should be by way of general taxation.

Other existing taxes would have no place in a future tax system and should be phased out over time. The elimination of a large number of taxes that distort production decisions or add to production costs would improve the competitiveness of Australian business. Fewer taxes would also enable further automation of tax administration, reducing business compliance costs.

8.1 Road transport taxes

Current road tax arrangements will not meet Australia's future transport challenges. Poorly functioning road networks harm the amenity, sustainability, liveability and productivity of our society. Moving from indiscriminate taxes to efficient prices would allow Australia to leverage the value of its existing transport infrastructure. Less congested roads, shorter travel times and investment in road infrastructure that addresses user demand would provide a foundation for further productivity growth, improved living standards and more sustainable cities.

There are large challenges facing transport in Australia. In particular, under 'business as usual' assumptions, the avoidable costs of urban congestion may grow to around \$20 billion in 2020. This cannot be reduced simply by building more city infrastructure, as most new road space induces new traffic. Helping to manage road use, through efficient prices, provides the best long-term approach to reducing congestion.

If fuel tax is used as a variable road charge, it should apply to all transport fuels. Equally, fuel taxes should not exceed the levels justified by broadly defined social costs of use (whether of roads or environmental costs).

In major cities, location-specific congestion charges should vary according to the time of day. City roads would be less congested during peak periods, with travel at higher speeds and shorter travel times, saving time for road users, reducing vehicle costs and greenhouse emissions. The revenue from congestion charges on existing roads should flow back to the community, initially to finance public transport in affected areas.

Heavy vehicle charging would ensure that individual trucking operators pay their own specific costs, no longer cross-subsidising or being subsidised by other operators. Truck operators would have incentives to avoid route choices and vehicle configurations that cause the highest costs, but would have access to roads and bridges they are willing to pay for. Revenue from road-wear would directly fund road owners' maintenance.

In addition to helping manage demand for transport, reforms could be considered to ensure that spending on roads matches anticipated need. This should be determined according to strategic planning and comprehensive and transparent benefit-cost analysis. This would help ensure new roads are built where needed, and roads are maintained to minimise total life cycle costs, including costs to road users. Road users with specific needs could enter commercial agreements with road suppliers.

Existing institutions have not led to the most efficient use and supply of roads. Prices are essential to making the best use of roads, but they must be coupled with improved governance that better serves the needs of road users, now and in the future. New investment based on economic criteria and accountability for investment decisions would help ensure that roads are constructed and maintained in accordance with future needs.

Appendix B: Additional Information

Annotated Excerpt from [SSi]

Tolls and Rail Patronage

On 16 February 2010, the concession on the M4 Motorway expired and ownership was transferred from Statewide Roads to the NSW Government. The toll on the M4 Motorway was removed at this time. Immediately prior to its removal, the motorway toll was \$2.75 for cars and \$6.60 for trucks [excluding the Cash-Back program]. ([EIS] - Appendix D – Page 91)

From the RTA's assessment there was a 500 vehicle drop in traffic on Parramatta Road in the four hours of the morning and a 1500 vehicle increase in vehicles on the M4 (Western Expressway). This represents an induced traffic effect of over one thousand vehicles [from ending the toll].

The effect is evident by the immediate visible increase in road congestion and reduction in travel speeds experienced on Sydney's roads. After the toll was removed, the average monthly rail patronage started to slide because of the significantly reduced patronage caused by mode shift to private vehicles. With each month, the new reduced baseline pulled the twelve month rail patronage average lower.

You can see quite clearly on the below graph where the slower timetables and removal of the toll on the Western Expressway have significantly reduced the patronage on the Western Line. However you can also see that the trend is holding for over 150% growth (300,000 passengers a month) above the 2001 figures.

Note: the NSW Bureau of Transport Statistics recommends the use of the 12 month average on rail Patronage data to eliminate seasonal variation due to factors like wet weather.

State of the Environment

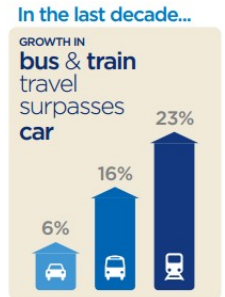
In 2012 the Environmental Protection Agency released "NSW State of the Environment Report 2012" which empirically assessed the observed transport usage data and found many important changes, including those outlined below.

While the number of trips in Sydney has been growing, the proportion of trips using private vehicles peaked in 2004–05 and is now the lowest it has been in 11 years.

In contrast, over the same period, total public transport passenger kilometres travelled grew at nearly double the annual average rate of VKT at 1.1% per year (BTS 2011).

The Liverpool–Parramatta Transitway amounts to more than 200 million passenger trips annually in the Sydney metropolitan region. ([SoE] Section 1.1)

The Transport Data Centre (now the [NSW Transport Performance and Analytics]) followed up on the report by the EPA with their “2011/12 Household Travel Survey - Summary Report 2013 Release”. With the release of the report the need for public transport has become suddenly very clear. In the past decade Sydney’s population has increased by 12% but the demand for Sydney’s trains increased by 23% and Sydney’s Buses by 16%. However the growth in private vehicles for personal and commercial purposes only grew by 6%. The BTS even provided this cute infographic.



Tolls [SSI]

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We can see from the numbers that there was a significant surge in the number of vehicles using the Parramatta Rd and M4 corridors when the tolls were removed. In fact there was approximately an extra thousand vehicles in the corridor; on top of those who changed roads. This is why the Commonwealth Treasury, Infrastructure NSW and the Productivity Commission all recommend the introduction of distance based, time-of-day road pricing.

	Parra Rd Before	Parra Rd After	Parra Rd Difference	M4 Tolloed	M4 Untolloed	M4 Difference
AM 06:00 – 10:00	2370	1869	-501	8124	9657	+1533
PM 15:00 – 19:00	2820	2511	-309	8243	8979	+736

Change In Traffic With M4 Toll Removal - M4 Toll Plaza and Parramatta Road, Silverwater (Appendix D Page 72)

Estimated Traffic

	Parra Rd 2021	M4 2021	Parra Rd 2031	M4 2031	Parra Rd Diff	M4 Diff
AM Peak	2740	12120	3450	12930	710	810
Inter-Peak	2730	9960	3020	10620	290	660
PM Peak	3140	11680	3820	12330	680	650

Traffic By Time Period on M4 Motorway At Toll Plaza (2021 vs 2021)

... According to the numbers contained in the Westconnex [EIS] and Appendices the widening of the M4 will actually reduce the total amount of traffic in the corridor. The government acknowledges that there will be an increase in traffic on Parramatta Rd as motorists compare the toll to their VTTs and find it to be too high. However the [proponent] does not mention the fact that there will be a total reduction in traffic within the corridor as discretionary or impulse trips are deferred or redirected to other transport modes like public transport. [Emphasis added]

Increased traffic on Parramatta Road and other roads due to toll avoidance.

	Parra Rd	M4	Parra Rd After	M4 After	Difference
AM Peak	2740	12120	3350	10740	-770
Inter-Peak	2730	9960	3310	6610	-2770
PM Peak	3140	11680	2510	8600	-3710

Traffic By Time Period on M4 Motorway At Toll Plaza (2021): Base and M4 Widening Scenario

To put it simply the state can make most of the [congestion problem on the M4] go away by reintroducing tolls. That would improve travel speeds and provide revenue to pay for important capital works...

Alternatives

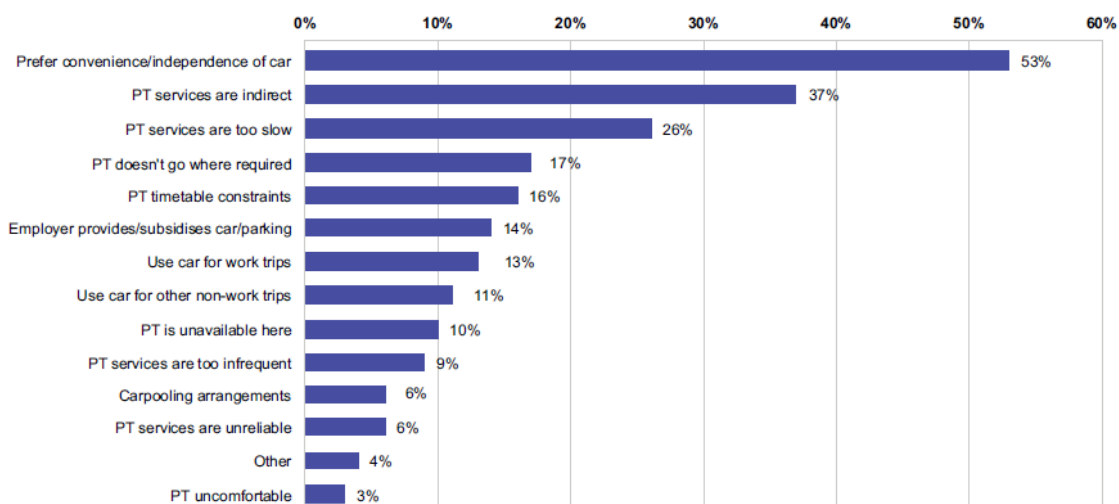
NSW 2021 Goal 20 – ‘Build liveable centres’ has set a target to increase the percentage of the population living within 30 minutes by public transport of a city or major centre in the Sydney metropolitan area.

Infrastructure NSW recommends Time of Day Pricing in [SIS] on page 91. The Australian Future Tax Review, and so the Commonwealth Treasury recommend an increase in the use of road pricing; as does the productivity commission, the NRMA, and countless other public and private reviews into Australian Transport.

*This analysis suggests that ultimately it may be desirable to implement a comprehensive system of congestion pricing on the [Sydney Strategic Road Network], but ...
... existing road charges may need adjusting ([SIS])*

The NSW Household Travel survey has been asking people for over a decade why they commute by car. The answers are quite obvious and many feed into the Strategic Travel Model.

Figure 3.5.2: Reasons for commuting by car, 2011/12



Refer to Table 4.3.5

[HTS]

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