

A FORK IN THE ROAD

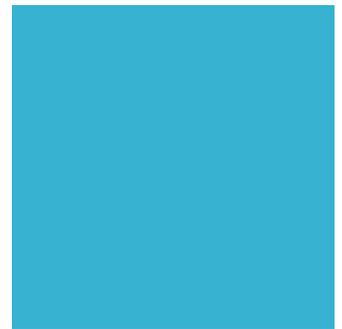
A new direction for congestion management in Sydney



The Committee for
Sydney

COMMITTEE FOR SYDNEY ISSUES PAPER 12

APRIL 2016



INTRODUCTION

The Committee for Sydney believes there is an urgent need for a better civic dialogue about transport options in Sydney. With notable exceptions,¹ the current debate appears to be too polarised, ideological and mode-led, characterised more by heat than light. There is a need for a cooler, more evidence-based approach and a recognition that cities are complex and multi-faceted and no one transport mode will meet all needs.

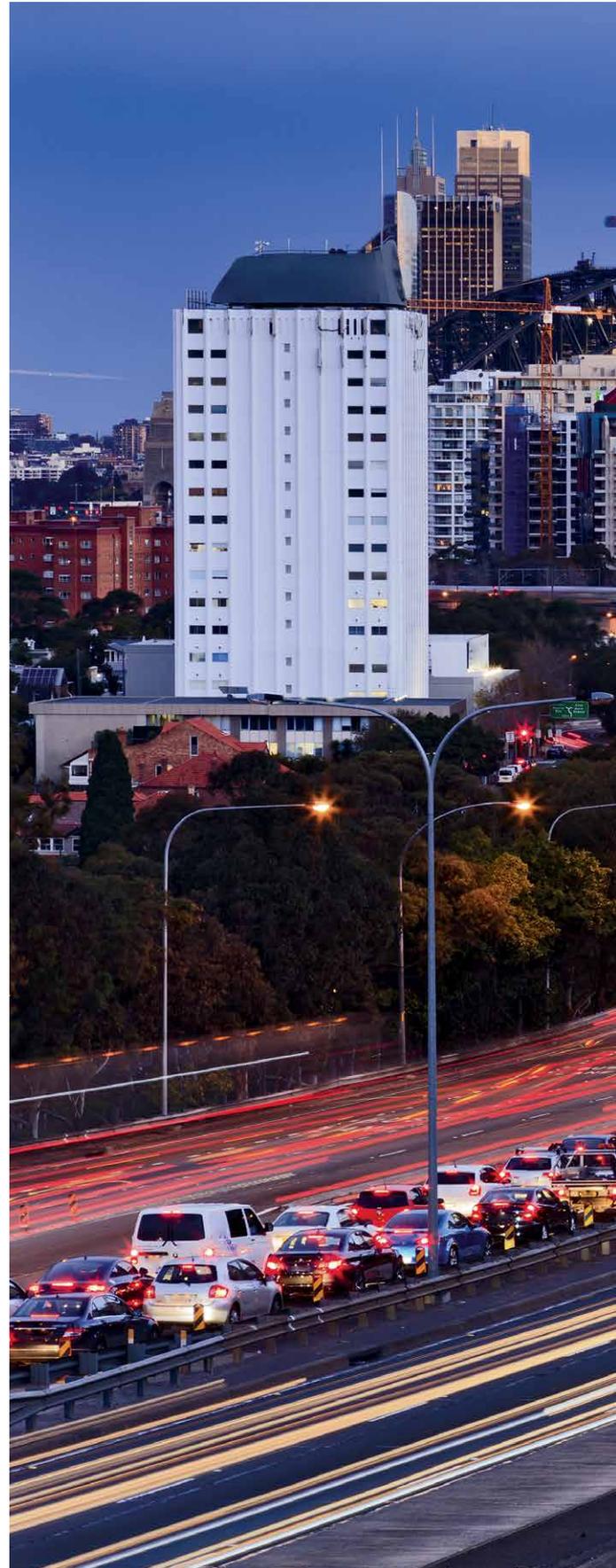
That approach brings challenges for government agencies and the community. For government agencies, it means having robust and transparent appraisal methods for selecting one transport mode or policy over another, and a respect for the concerns of communities affected by significant infrastructure projects. For communities, it means accepting necessary change when the broader public benefits have been shown.

Addressing congestion must be part of this. But we must also not lose sight of the objective: reducing congestion means commuters in Sydney will spend less time stuck in traffic – and more time with family and contributing to our city. This has significant economic benefit for the city and for the community.

In our view, Sydneysiders will support whatever transport mode or intervention is shown to be required to meet the city's needs. But they will expect that the appraisal process used is mode-neutral, transparent and evidence-based, resulting in transport projects or interventions which deliver maximum public benefit and the best strategic outcomes for Sydney.

Sydneysiders will back projects, whether they involve new roads, new public transport or the more efficient use of – or rationing of – existing infrastructure, if they are genuinely necessary, fit for purpose, cost-effective and maximise returns to the community. They will also expect them to be forward-looking and contribute to the management of a city with a projected population of eight million people by 2056. They will expect their civic leaders to build for the city we want and not just the city we have.

At the heart of that objective will be how such projects manage congestion and the demand for road use.



¹ **National Roads and Motorists' Association (NRMA)**. *Improving the Performance of Sydney's Road Network*, Huston Kemp Economists 2015, http://www.mynrma.com.au/media/Toll_Roads_NRMA_report.pdf

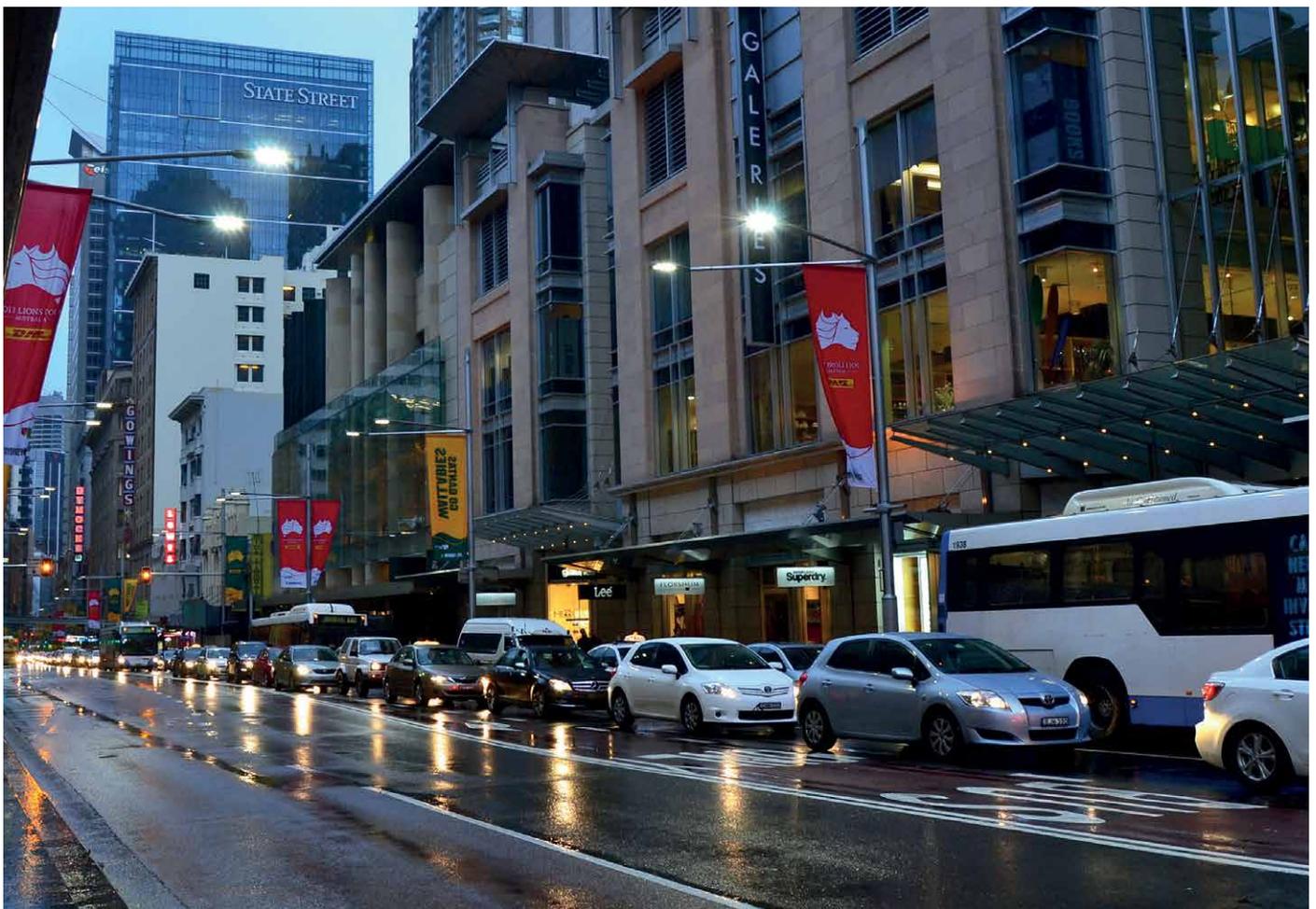


CONGESTION: SYDNEY'S KEY CHALLENGE

Infrastructure Australia's report *Australian Infrastructure Audit 2015* identified congestion management as the most significant transport management issue facing Sydney. It noted that seven of the eight most congested corridors in Australia were in Sydney and that by 2031 demand on these corridors is projected to 'significantly exceed current capacity'. The report said the current delays on roads in the six largest Australian capital cities cost the economy around \$13.7 billion, and warned that in the absence of 'appropriate strategies',² that cost is set to increase to over \$50 billion by 2031. Infrastructure Australia (IA) seeks precisely the kind of debate the Committee exists to promote, and has itself called for, regarding the 'appropriate strategies' that might be most effective in dealing with Sydney's congestion challenge.

Time to review our approach

While successful cities all experience congestion, particularly at peak travel hours, some manage it better than others. London, Singapore, Stockholm, Milan, Santiago and a range of US cities are amongst those developing new congestion interventions and strategies, and targeting scarce public funding accordingly.³ Currently, Sydney is experiencing record levels of investment in transport infrastructure, *together with high levels of congestion*, and the Committee believes this is the right time to review international best practice for congestion management, with a view to adapting it to Sydney's challenges.



² **Infrastructure Australia**, Australian Infrastructure Audit Report Key Findings, 2015, <http://infrastructureaustralia.gov.au/policy-publications/publications/files/Australian-Infrastructure-Audit-Key-Findings.pdf>

³ **Transportation Association of Canada**, Road pricing in an urban context, 2009.

A congestion management review is also needed right now because although some commentators believe that car-usage has peaked in Western society – and particularly amongst young adults – it is not clear to what extent rising petrol prices to 2013/14 affected the outcome or what the impact has been, if any, of lower prices since then. If prices, though rising again, remain at levels which are significantly below the peak, that will likely lead to higher car usage and, consequently, increased congestion. At the same time, with lower petrol prices and greater engine efficiency, there will be declining public revenue from the petrol tax. This outcome has led the NRMA to stress the need for a strategy for road-pricing not least as a way of paying for infrastructure in this era of depleted public resources.⁴

Over a longer period, macro level changes in the structure of our economy and the patterns of residential development are clearly now intensifying the challenges of congestion on our roads. The declining level of employment in manufacturing on the urban fringe and the increasing concentration of knowledge workers in centres of agglomeration, combined with a still powerful sprawl pattern of low density housing development across much of Greater Sydney, has been exacerbated by long-term underinvestment in our public transport network. The road network that was once able to efficiently move goods and people from their homes to work between lower density locations on the urban fringe, is now relied upon to move people from a large number of suburban residential locations to a small number of urban centres and employment hubs – increasing congestion across the entire city, particularly at peak times. The city changed but the transport network didn't.

Coordination of multiple measures needed

Responding to such challenges will require a suite of interventions. In this context, it is welcome that the NSW Premier signalled the need for new thinking on dealing with road congestion by including it in his *Premier's Innovation Initiative*.⁵

Many of the proposals to the NSW Government for dealing with Sydney's congestion challenges are likely to involve investment in new infrastructure, both road and rail. However, having reviewed a large number of transport studies, the Committee strongly agrees with Infrastructure Australia, that while specific projects to increase capacity in both road and rail networks may be appropriate, we need to consider demand management measures to make the best use of our roads and to 'support the efficient movement of vehicles that are most important for supporting economic development – trucks, commercial vehicles and road-based public transport'. Such demand management measures 'could include CBD parking levies, increased use of lanes for high-occupancy vehicles and buses and, ultimately, road pricing', all enabled by increasingly smart technologies.⁶

Over a longer period, macro level changes in the structure of our economy and the patterns of residential development are clearly now intensifying the challenges of congestion on our roads.

4 **NRMA**. *Improving the Performance of Sydney's Road Network*. Houston Kemp Economists 2015. http://www.mynrma.com.au/media/Toil_Roads_NRMA_report.pdf

5 **NSW Government**, *The Premier's Innovation Initiative – Congestion*, 2015, <http://www.nsw.gov.au/innovate/congestion>

6 **Infrastructure Australia**, *Australian Infrastructure Audit: Our Infrastructure Challenges*, Vol. 1, April 2015, p. 90. <http://infrastructureaustralia.gov.au/policy-publications/publications/files/Australian-Infrastructure-Audit-Volume-1.pdf>



Infrastructure Australia has stated that there is an acute need for 'integration of long-term planning in order to anticipate and address growing demand and avoid unnecessary additions to transport tasks, making efficient use of existing transport infrastructure'.⁷ We agree: better alignment of land use and transport planning is needed, so that homes and jobs are better located and connected in this city. This is why we welcome the Greater Sydney Commission whose very purpose is to bring that integration, though we warn that greater cross government coordination than we have seen for decades will be required if this vital objective is to be realised on the ground. We also welcome Infrastructure Australia's emphasis on the need to recognise that sometimes the best transport option - and the one which may result in most public benefit - is not new infrastructure, whether in the form of public transport or roads, but more efficient use, or 'sweating', of existing infrastructure assets.

In terms of congestion management, the best results may indeed not be achieved just by new, and often costly, initiatives, but by channelling, rationing or reducing demand pressures. Given that future NSW Governments may not have access to the funding for new infrastructure investment that the current Government will enjoy through the partial leasing of the electricity network businesses (poles and wires), the cost-effectiveness of alternatives - which may be cheaper and have more impact on congestion management - clearly need to be explored.

The Committee has examined a significant body of research on congestion, including academic papers, expert reviews, government reports and case studies from across the globe. The basic crux of this research says that a multifaceted approach is needed to reduce congestion, including better information provision to enable more informed choices - but that any congestion strategy that excludes demand management, and particularly road pricing or congestion charging, will fail. Or, as a ground-breaking study of congestion management in Los Angeles by the RAND Corporation puts it: 'any package of reforms that does not include pricing strategies will not achieve lasting reductions in traffic congestion'.⁸ We believe that the civic dialogue Sydney needs to have on congestion must embrace this international research.

7 **Infrastructure Australia**, State of Australian Cities 2014-2015 - Chapter 1, https://infrastructure.gov.au/infrastructure/pab/soac/files/2015_SoAC_Chapter_1.pdf

8 **Sorenson, Paul., Wachs, Martin. et. al.**, *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, RAND Corporation, 2008, pg. xviii

CONGESTION ISN'T JUST A SUPPLY-SIDE PROBLEM

Part of the challenge behind the acceptance of demand management as a tool in congestion management is to deal with the accepted view that the policy and investment response to congestion should simply be to provide more of what has become congested. That is, the solution lies on the supply side. The assumption made is a shortage of road capacity must be causing the long queues and delays which are manifested on Sydney's roads at certain times, so therefore the answer must be to supply more road capacity, with the aim of increasing speeds achievable to drivers.

Though congestion may be experienced on the road, in reality it is a by-product of macro level factors contributing to overall travel demand. This includes land use policies which encourage sprawl and thus extra vehicle journeys, and economic incentives or policies which facilitate greater car-use as opposed to other modes. Consequently, congestion management in the long-term is not only a traffic engineering problem, it is a broader city management problem. It requires an integrated approach to land use and transport, and the right transport policies and incentives in place to shape or reduce demand.

Unfortunately, the 'common sense' view, in over-emphasising the transport supply side, results in a perfect example of the 'law of unintended consequences', with extra supply actually inducing extra demand. Or as one respected expert on transport puts it, 'Urban roadway expansions tend to reduce congestion in the short-run, but this benefit tends to decline over time as generated traffic fills the additional capacity.'⁹ The discussion of congestion solutions in Sydney needs to be informed by an understanding of the generated or induced demand problem.

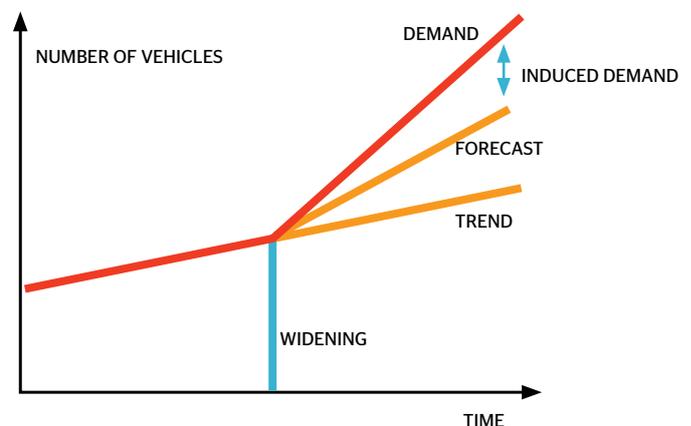
Induced demand: the 'triple convergence' phenomenon

Induced demand happens when increasing the supply of roadways actually triggers demand to use them, especially when the supply is free or under-priced. That is, supply can actually create demand – as depicted in Figure 1. Extra supply does this through initially lowering driving times thereby causing more people to drive and thus cancelling out all initial reductions in congestion.¹⁰ Congestion constrains growth in peak-period trips, but if road capacity is increased, peak-period trips also increase until congestion again constrains traffic growth.¹¹ This is the 'triple convergence' of induced demand, which occurs as additional travellers will tend to converge on new roads from:

- other times of travel;
- other routes of travel; or
- other modes of travel.¹²

Figure 1: Induced Demand

The net increase in total vehicles surpassing forecast levels as a consequence of induced demand eliminates any benefit of congestion relief in the short or longer term¹³



⁹ **Litman, Todd.** Smart congestion relief: Comprehensive evaluation of traffic congestion costs and congestion reduction strategies. s.l. : Victoria Transport Policy Institute, 2013, pg. 42

¹⁰ **Speck, Jeff.** *Walkable city: How downtown can save America, one step at a time.* Macmillan, 2013, pg. 82

¹¹ **Litman, Todd.** *Generated Traffic and Induced Travel: Implications for Transport Planning.* Victoria Transport Policy Institute, 2015.

¹² **Downs, Anthony.** *Why Traffic Congestion is Here to Stay... and will get Worse.* ACCESS no.25, Fall 2004

¹³ **Marshall, Wes.** *Elements of Access: Induced Demand.* Transportationist. March 2, 2015. <http://transportationist.org/2015/03/02/elements-of-access-induceddemand/>.

Wherever supply-side strategies have been attempted, it has been shown – and not just academically but in the lived experience of commuters – that if you build it, they will come. As shown in Figure 2 below, this process amounts to a self-reinforcing loop.

Figure 2: The Induced Traffic Effect
Cyclical view of causation between road provision and traffic congestion¹⁴



The evidence for this phenomenon has long been available and analysed. Indeed, over 10 years ago, a compelling review of dozens of transport studies concluded that, on average, increasing a road by 10 percent immediately increases average vehicle travel by 4 percent and that this reaches 10 percent—equalling all the new road capacity—within a few years.¹⁵

So the evidence is that road expansions tend to reduce congestion only in the short-run and that this benefit tends to decline over time as generated traffic fills the additional capacity. So important is this factor that since the 1990s in the UK, transportation planners making business cases for road investment have to make due allowance for the full impact of induced demand on claims for travel time reduction arising out of that investment being sought.¹⁶ In the UK, cost benefit analyses must assume that average trip length will increase just as much as speed increases. This is because higher speeds achieved from road capacity increases in practice lengthen trips and do not actually save any time.

By contrast, business cases and appraisal methodologies in NSW still overwhelmingly stress congestion and travel time reductions as the key outcomes claimed for road investment, and if they make allowance for induced demand at all they do so modestly. It is common for road projects to attribute up to 80% of their benefit to reductions in travel times. Given these reductions don't actually accrue in practice, it is essential to accurately factor in induced demand. One expert suggests in this context that lay people might find it 'surprising that it has been possible to value a phenomenon not empirically demonstrated to exist'.¹⁷ We agree.

Reducing demand - not just increasing supply: the key

The idea that new roads can induce demand is reinforced by the experience of what happens when a city's road supply is, as is sometimes the case, reduced. An international study of seventy case studies across eleven countries found that removing road capacity consistently reduced overall traffic levels, finding that claims that congestion is merely diverted to other roads and local streets were exaggerated.¹⁸ This has also been evidenced in Sydney where construction of the light rail down George Street has not significantly exacerbated congestion as some opponents forecast.

14 **Floyd, Josh.** *Driving in circles: road building and causal thinking.* *Beyond this Brief Anomaly.* February 15, 2013. <http://beyondthisbriefanomaly.org/2013/02/15/driving-in-circles-road-building-and-causal-thinking/>.
15 **Speck, Jeff.** *Walkable city: How downtown can save America, one step at a time.* Macmillan, 2013, pg. 83

16 **Standing Advisory Committee on Trunk Road Assessment,** *Trunk Roads and the Generation of Traffic,* London 1994
17 **Metz, David,** *The Myth of Travel Time Savings,* *Transport Reviews,* April 2008, Vol. 28:3, pg. 325
18 **Cairns, Sally, Atkins, Steve and Goodwin, Phil** *Disappearing traffic? The story so far.* *Proceedings of the Institution of Civil Engineers,* Vol. Issue 1, March 2002, pp. 13-22.

While the full impact of the light rail construction is still being investigated, it appears that traffic congestion did not worsen as commuters actually changed their behaviour and travelled by other modes or outside the peak.

The most prominent international example of this effect occurred in South Korea, with the removal of the Cheonggye Freeway in 2003 that had previously carried 168,000 cars a day into Seoul. In the place of the freeway, a nearby river was restored and a park created, coupled with new investment in a bus rapid transit service. The result was higher economic activity, greater urban amenity, higher land values, and lower congestion.¹⁹

Similar impacts were seen in the US in San Francisco with the removal of the Embarcadero Freeway and in Milwaukee with the removal of the Park East Freeway.²⁰

In Australia, behavioural change was measured during the brief closure of the Brisbane Riverside Expressway. In 2006, the expressway was closed for three days and it was found that affected commuters opted for a combination of changing their route (50%), time of travel (40%), mode of transport (15%) or destination (10%).²¹

All this reinforces the key point of this paper: in attempting to regulate or reduce congestion in a city, success lies not just in increasing supply of transport infrastructure but in managing demand. While managing demand for road space can take many forms – some of them about using new digital technologies to better inform road users about their travel options particularly in the peak – all roads do indeed lead to a discussion about pricing.

Queuing - why supply alone cannot address congestion

If free tickets to a concert are offered to the first 400 people in a queue you'll get 400 people standing in line, many content to camp out overnight to do so. They are paying time to save money. Current road pricing policy requires all motorists to act exactly like these concert-goers. Motorists are made to pay for road use in time spent in traffic, rather than in money, even though some of them would rather do the opposite and our cities would be safer and more efficient if they were able to. Prevailing road pricing policy requires motorists to save money, which is a renewable resource, by expending time, the least renewable resource of all.

Congestion is the result of under-pricing, leading to queues. Visualize a major commuting road so heavily congested each morning that traffic crawls for 30 minutes or more. If that road were somehow magically doubled in capacity overnight, it's fair to assume the next day the traffic would flow rapidly because the same number of drivers would have twice as much road space.

But very soon, and sometimes immediately, word gets around that this road was uncongested. Drivers who had formerly travelled before or after the peak hour to avoid congestion would shift back into that peak period. Other drivers who had been using alternative routes would shift onto this now convenient road. Some commuters who had been using transit would start driving on this road during peak periods.

This is how induced demand works. It's about the push and pull factors around queueing and access to services. And just as with other queues, if the line is long for a certain free or under-priced service, many customers will decide to come back when it's shorter. If it is a short queue, by joining it they make it longer for others. Pricing is the only thing which changes the fundamental dynamics of this situation.

19 **Seattle Urban Mobility Plan.** *Case Studies; Lessons Learned- Freeway Removal*, 2002

20 **Institute for Transportation and Development Policy and EMBARQ.** *The Life and Death of Urban Freeways*, 2012. https://www.itdp.org/wp-content/uploads/2014/07/42.-LifeandDeathofUrbanHighways_031312.pdf

21 **Australian Transport Council.** *Australian Capital City Congestion Management Case Studies*, 2009, pg. 13

Increasing public transport - necessary, but not sufficient to solve congestion

Many public transport advocates, not surprised by the phenomenon of induced demand, will stress that the answer to congestion is simply greater provision of mass transit. However, much expert opinion doubts that extra public transport in and of itself is the solution to urban congestion, though the evidence does suggest in congested urban corridors and CBDs, that enhanced public transport is part of a successful congestion management strategy. Crucially, it is a core part of a modern economic strategy to grow employment in job-dense urban agglomerations without exacerbating road congestion.

Necessary for a modern knowledge economy...

Public transport not only serves this agglomeration of jobs that is the defining characteristic of the modern urban knowledge economy. Economic growth of this kind actually requires public transport to flourish. This is because once a city reaches a certain level of congestion and hits a wall in terms of road space, rail or bus systems are the only way to pump more people into the central areas that produce enhanced economic activity without worsening road congestion.

If your city is car-dependent, that congestion limit becomes the cap on the economic activity – and thus the prosperity – of your city. However, to the extent that your city has access to an effective public transport network, supported by walking and cycling, economic activity and prosperity can continue to grow without worsening congestion. Essentially, it is the expansion of Sydney's public transport system over decades that has permitted the constrained Sydney CBD to grow beyond what the road network would have supported.

...but not sufficient to solve congestion - and it does not escape the induced demand challenge

However, it must be understood that in certain circumstances extra mass transit supply can also perversely lead to greater use of the road.

This is because potential road users become actual road users when they assume that the roads will be less congested because the new rail or bus infrastructure will divert drivers onto mass transit - as the shorter 'queue' for roads encourages new drivers to get in the car.²²

When applied to transport this means, ironically, that just as with extra road supply, so too can extra mass transit supply be seen by potential road users as a signal that the queue on the road will actually be cut. So they use the road and may even swap their seat on the bus or train to do so.

Mass transit is vital in the modern city and becoming more so as more and more jobs get concentrated in fewer and fewer places and access to them by car becomes inevitably more and more difficult and indeed less efficient as a people mover in a modern high density city. So the Committee believes that a decisive modal shift to public transport will be required to enable a city of eight million, with an economy based on knowledge jobs rather than manufacturing, to function sustainably.

We strongly encourage the NSW Government to promote such a modal shift and particularly to seek improved and space-efficient transport options (walking, cycling, mass transit, ride-sharing, car-sharing and telecommuting) - and to initially target such improvements on congested urban corridors. However, on its own, extra investment in public transport can only make a contribution to congestion management. It will not solve the overall city congestion challenge.

It can and must form part of a broader multimodal congestion strategy with demand management and particularly congestion charging/road pricing at the core - our review shows that this is the only effective and durable tool for ensuring free-flowing roads while maintaining or growing prosperity.

Indeed, a major public transport network is also essential for congestion pricing to succeed. Congestion pricing always causes mode shift toward public transport, so quality public transport, with surplus capacity, must be there or be developed for a pricing plan to be credible. One US study of great relevance to NSW, found that motorists were four times more supportive congestion charging, when they lived in an area with a high quality public transport system, than motorists in other areas.²³

And of course, as we have seen in London, having the congestion charge actually enables new income for and investment in the public transport network. In the first ten years of operation of the London congestion charge, £2.6 billion was raised, of which just under half was invested in public transport, road and bridge improvement and walking and cycling schemes.²⁴

22 **Duranton, Gilles and Turner, Matthew A.**, *The Fundamental Law of Road Congestion: Evidence from US Cities*, *American Economic Review* Vol. 101, October 2011, pp. 2616-2652

23 **Litman, Todd**, *Smart Congestion Reductions II: Reevaluating The Role Of Public Transit For Improving Urban Transportation*, Victoria Transport Policy Institute, March 2011

24 **Automobile Association (AA)**, 10 Years of congestion charging, 2013, <http://www.theaa.com/newsroom/news-2013/ten-years-of-congestion-charging.html>

DEMAND MANAGEMENT

In transport, as in any network, managing demand can be a cost-effective alternative to increasing capacity. Of course, congestion is itself a blunt form of demand management. Either through paying with time or paying with money, we all pay for using roads. Queuing on congested roads just happens to be the most inefficient form of demand management available. We can do better.

Demand management in the transport domain consists of strategies and policies to reduce travel demand (and especially that of single-occupancy private vehicles), or to redistribute this demand either in time or spatially. Those policies can vary in type and indeed effectiveness and may include:

- Increasing the use of ridesharing;
- Promoting active transport;
- Limiting parking;
- Improving public transport - both through increasing the network and improvements to interchanges;
- Subsidizing mass transit costs for employees or residents - perhaps by enabling salary sacrifice for company cars to be traded in for Opal Cards or enabling developers to offer Opal Cards in lieu of parking spaces in apartments;
- Providing traveller information tools, including intelligent transportation system improvements, mobile and social applications and wayfinding tools;
- Workplace travel plans and flexible work times to enable employees to travel out of peak hours;
- Road pricing tolls during peak hours; and
- 'Time, distance and place' (TDP) road pricing, where road users are charged based on when, where and how much they drive.

Of course, congestion is itself a blunt form of demand management. Either through paying with time or paying with money, we all pay for using roads.

In reviewing these approaches, the Committee notes that part of the challenge for governments seeking advice on options is the need to get beyond professional silos to holistically identify what will achieve a long-term reduction in congestion.

So for those pioneering intelligent transport systems, managing demand is about using digital platforms and data analytics to understand and shape traffic flows in real time and to empower consumer choices through information. On the other hand, for proponents of mass transit and active transport it can mean shaping demand by increasing the supply of rail infrastructure and dedicated bus and bike-lanes or designing safe walking environments through designing roads to be used by all and not just vehicles.

For economists, however, demand management is about pricing the road system to find the equilibrium between supply and demand. For the Committee for Sydney this last factor is critically important and has not had sufficient attention paid to it by policy-makers and governments.



Demand management through information

We stress, there is of course an important place for 'softer' demand management approaches focussed on better information about options for transport users. The Committee has previously commended the innovative Transport for NSW approach to developing real time service information for public transport and road users enabled by modern digital and mobile technologies. We commend the pioneering work done around the construction of the CBD and South-East Light Rail, where a demand management scheme has been implemented with a view to managing congestion during the period of construction. This scheme has involved public awareness raising. Techniques used include posters, billboards and television ads to raise general awareness, direct engagement with CBD-based businesses and their staff to develop customised travel plans, and online tools to help individuals find quicker methods of commuting.

While the program has been successful in changing behaviour, the effects of this campaign are likely to be short-lived,²⁵ with further strategies and incentives required to maintain the reduction in congestion. Indeed, a campaign of this kind by its nature relies on dramatically disrupted circumstances to motivate commuters to change their behaviour. For long-term congestion reduction, something more enduring than information and awareness will be required to effect significant behaviour change. Material or economic incentives are needed: with the evidence being that they are decisive in long-term behaviour change.



A Transport for NSW image as part of the Travel Choices Campaign, 2016

To reiterate, our research supports an international finding: if the objective is managing and reducing congestion, an integrated package of reforms to enhance user knowledge of transport options and provision of mass transit alternatives is necessary. But, it will not be sufficient without strategies for managing the demand for peak-hour car travel via the evidenced mechanism of pricing.

An integrated package of reforms to enhance user knowledge of transport options and provision of mass transit alternatives is necessary. But, it will not be sufficient without strategies for managing the demand for peak-hour car travel via the evidenced mechanism of pricing.

²⁵ Sorenson, Paul, Wachs, Martin. et. al. *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, RAND Corporation, 2008, pg. xviii



Pricing use: not new to Sydney

Demand management in its road pricing form is, of course, not new to Sydney. We have had several significant experiments in variable toll pricing. The Sydney Harbour Bridge and Tunnel have variable peak tolling. However, prices seldom changed and so the impact on congestion eroded over time, and that combined with induced demand from the Lane Cove Tunnel has returned the Harbour Bridge and Tunnel to their previous levels of congestion.

We have of course also seen numerous examples of tolling to pay for new road capacity. While this demonstrates that road pricing impacts on road usage, the Committee is concerned that the NSW Government's ability to toll specific and discrete road projects is an example of the tail wagging the dog: with projects being promoted because they are fundable rather than because they are necessary or the best way of meeting a strategic transport or access need. Equally, there is a concern that road pricing via tolling has become a way of paying for roads and of inducing rather than shaping demand. Furthermore, there is a danger that the proliferation of tolling regimes for different road projects, usually locked down for decades, will make it more difficult to introduce a coherent, strategic approach to road pricing and thus congestion management across Sydney, including for existing roads.

Parking levies

In addition to tolling and modest road pricing initiatives, parking levies have been implemented in the Sydney CBD, North Sydney, Bondi, Chatswood and Parramatta to encourage the use of public transport and improve air quality.²⁶ Academic research has confirmed that parking restrictions are an effective form of broad area demand management^{27,28}. However, we have failed to adjust parking levies in line with demand, and failed to extend the policy to emergent centres where, despite significant public investment and some innovative interventions by companies to improve take up by staff of mass transit alternatives, commuting by public transport remains low. Norwest Business Park is an example - and one that will be tested further as it will soon be connected to the new Sydney Metro. On past precedent this will not have the impact on road congestion hoped for, because of the continuing induced demand problem in the area as road use and parking will continue to be under-priced. Indeed, given the NSW Government commitment to provide commuter car parking for 4000 cars along this line, it is possible we may see higher rail *and* road use at peak times at such centres.

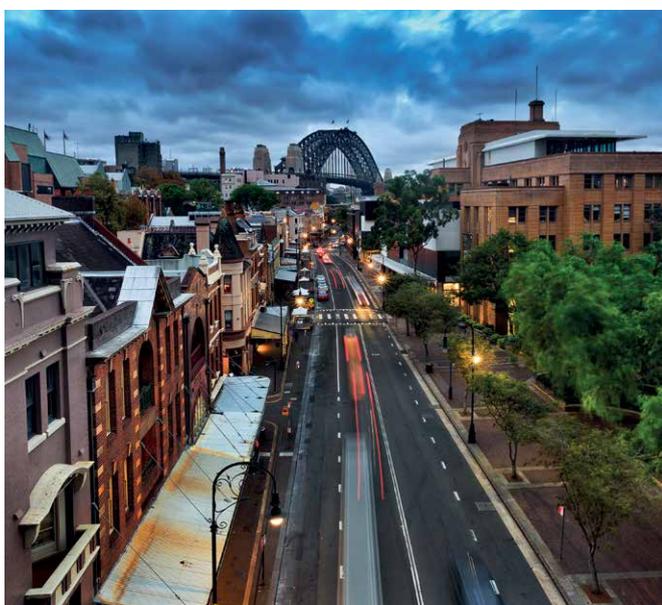
26 **Transport for NSW**. Parking space levy. *Transport for NSW*. [Online] June 17, 2014. <http://www.transport.nsw.gov.au/content/parking-space-levy>

27 **Joint OECD/ECMT Transport Research Centre**. *Managing Urban Traffic Congestion*. 2007, pg. 22

28 **Booz Allen Hamilton**. *Study of Successful Congestion Management Approaches and the Role of Charging, Taxes, Levies and Infrastructure and Service Pricing in Travel Demand Management*. Canberra: Council of Australian Governments, 2006, pg. 24

Political willpower

In our digital era, the challenge of demand management is not a technical one. We have the infrastructure and technology. Nor is the challenge a policy one as examples like London's congestion charge show the way. Indeed, the NSW Government and its relevant agencies have themselves previously identified the key demand management issues and policy approaches, in a Ministerial Inquiry in 2003,²⁹ a report commissioned by Infrastructure NSW in 2012,³⁰ and a 2012 Transport for New South Wales discussion paper.³¹ The latter identified 4 different forms of congestion charging in a long list of 16 'anti-congestion' policy options – including cordon and area pricing schemes, distance-based road pricing, location-based road pricing and time-variable road pricing. But none of the options were ever progressed or implemented. The challenge in Sydney is one of political leadership and community buy-in. As the RAND Corporation says of Los Angeles, though it applies here too: leaders must 'summon the political willpower to face a tough decision' to put a price on congestion.³²



PRICING CONGESTION

The only strategies proven to address congestion over time, without creating the effects of 'triple convergence', involve the use of pricing to manage the demand for peak-hour automotive travel.³³ Often described as 'congestion pricing', examples include charging higher tolls to drive during peak hours or charging higher prices to park in the most convenient places at the busiest times of day. The best known example is London where vehicle drivers pay a 'congestion charge' at peak hours within a defined geographical zone, with Central London and its business districts at its core. The results have been: sustained lower car usage and congestion; lower emissions; a benign impact on economic performance; and reduction in accidents.^{34 35}

There are four objectives that road pricing is used to achieve:

1. Funding the construction of individual roads, as per the current use of tolling in Sydney;
2. Funding the operations, maintenance and new construction of roads projects, with the ring-fencing of revenue to roads alone;
3. Forward-funding the construction of roads *and public transport* projects, with a mode-neutral approach to transport funding; and
4. Changing behaviour – reducing congestion through reducing trips in peak times on congested roads.

The Committee for Sydney believes an appropriate road pricing scheme for Sydney should prioritise the last 2 objectives – funding and maintaining mode-neutral transport infrastructure and changing behaviour.

29 Parry, Tom, et al, *Ministerial Inquiry into Sustainable Transport in New South Wales: A Framework for the Future*, Final Report, State of New South Wales, Sydney, December, 2003.

30 Ergas, Henry and Grieg, David, *Pricing Congestion in Sydney: Discussion Paper prepared for Infrastructure New South Wales*, April, 2012, p.viii.

31 *Transport for New South Wales NSW Long Term Transport Master Plan: Discussion Paper*, Sydney: New South Wales Government, February, 2012.

32 Sorenson, Paul, Wachs, Martin, et. al., *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, RAND Corporation, 2008, pg. xviii

33 Downs, Anthony, *Still Stuck in Traffic: Coping with Peak-Hour Traffic Congestion*, s.l. : Brookings Institution Press, 2004.

34 *Transport for London, Central London Congestion Charging: Impacts monitoring Sixth annual report*, 2008, <https://tfl.gov.uk/cdn/static/cms/documents/central-london-congestion-charging-impacts-monitoring-sixth-annual-report.pdf>

35 Green, Chris, Heywood, John S & Navarro, Maria, *Traffic Accidents and the London Congestion Charge*, Lancaster University Management School, 2014, <http://eprints.lancs.ac.uk/71071/1/LondonCongestionCharge.pdf>

There are many strategies to achieve these objectives, including ones that focus on specific roads or corridors of strategic significance or that differentially toll high occupancy lanes. The capacity of digital, interactive technologies to enable smart road pricing that changes as demand rises and falls in real time, or can differentiate between frequent and less regular road users, must be part of the demand management equation.

Currently, operational projects across the globe include five types of pricing strategies to manage demand:

- High-occupancy toll lanes – variably priced lanes that set pricing based on time of day, level of congestion, or a pre-set schedule;
- Variable tolls on individual major roadways – peak period-priced facilities that base pricing on time of day;
- Variable tolls on entire major road systems – coordinating the tolling structures on a network of major roads;
- Cordon or zone charges – variable or fixed charges to drive within or into a congested area; and
- Vehicle miles travelled charges – based on number of kilometres travelled on all roads that may vary depending on congestion.

The right pricing strategies to achieve the goals listed above may well be an evolving mix of the variable tolls, zone charges and vehicle miles travelled charges. We stress that while most of these strategies are the responsibility of state governments, the review of their relative impact or use should be undertaken by both the NSW Government and the Australian Government, particularly given its crucial role funding for road projects in Australian cities.

The pricing principle – and the need to be systematic

The principle behind congestion pricing is clear from the way the world's airlines work. They shape demand by charging different prices for seats depending on when they are reserved. Currently we are approaching congestion management in Sydney from the opposite position. We are giving something valuable away – road space – at less than its value or even free so demand is essentially infinite. Congestion worsens. We need to price road usage and do so systematically.

The current approach is anything but systematic. We make some roads free and some subject to tolls. Some are paid for by petrol taxes, some not. The contradictions and inefficiencies of this approach have been summed up by a former New York Transport Commissioner:

*'It's as if we had opened a fruit market where apples were a buck a piece and pears were free; even if shoppers preferred apples, you'd still be unable to keep pears in stock. The existing road system, all too often, works the same way, with drivers making decisions about the routes they take based on completely artificial – usually political – decisions about whether and how much they are going to be charged for using a finite amount of concrete and asphalt. This is the opposite of efficient...Drivers need to pay a higher price for travelling on a desirable route or at a popular time...So long as they have no price signal that tell them how and how much they would benefit by commuting at different times, drivers will inevitably commute inefficiently.'*³⁶

³⁶ Schwartz, Samuel I. *Street Smart: The Rise of Cities and the Fall of Cars*, Public Affairs, New York, 2015, p.105-6

Why is road pricing so effective?

The main reason that the effectiveness of pricing strategies is not eroded by triple convergence is that the very same peak-hour charges that encourage some to change their travel patterns also deter others from converging on the freed capacity. Simple but effective.

While for some advocates, road pricing is a way of ensuring that some of the externalities historically associated with car dependant city development – air quality, sprawl and health issues related to commuting and stress – are more equitably allocated to road users, the Committee's main focus is on what will actually impact on Sydney's congestion challenge.

Academics and economists agree, pricing roads and parking works.^{37 38} The most effective way to manage congestion is to manage demand with price. For a long time, we have accepted the need to price public utilities like electricity, water and public transport. We have even come to accept the need to price peak usage of such things and increasingly have smart technology enabling us to do so. The smart pricing of our roads is a concept which is long overdue in Sydney.^{39 40}

Smart and strategic: tolling, but not as we know it

We need to understand the difference between a toll to pay for a specific piece of infrastructure – which can lead to a confusing system of different tolls on different roads to fund different projects – and a more strategic regime which prices existing and not just new infrastructure in a single, integrated system.

Part of the challenge to overcome, in policy terms, is that road pricing or tolling needs to be understood as not just a way of paying for infrastructure. It is also a crucial tool in moulding benign, economically rational behaviour and the very shape, density and performance of our city.

While tolling, as a form of infrastructure funding, is legitimate and necessary, it can have perverse consequences. For example, projects may get green lighted by government because they can be funded by tolls rather than because they are strategically the right project for the city. Moreover, the business model behind current infrastructure tolling regimes which fund the building and operating of roads actually relies on prices being fixed at a level which induces demand rather than reduces it. Though errors have been made in forecasts of use, the very objective of such tolling regimes is to attract users to pay back investment and make a return rather than shape behaviour. We need a debate that allows us to separate the funding of road projects from the price of tolls.

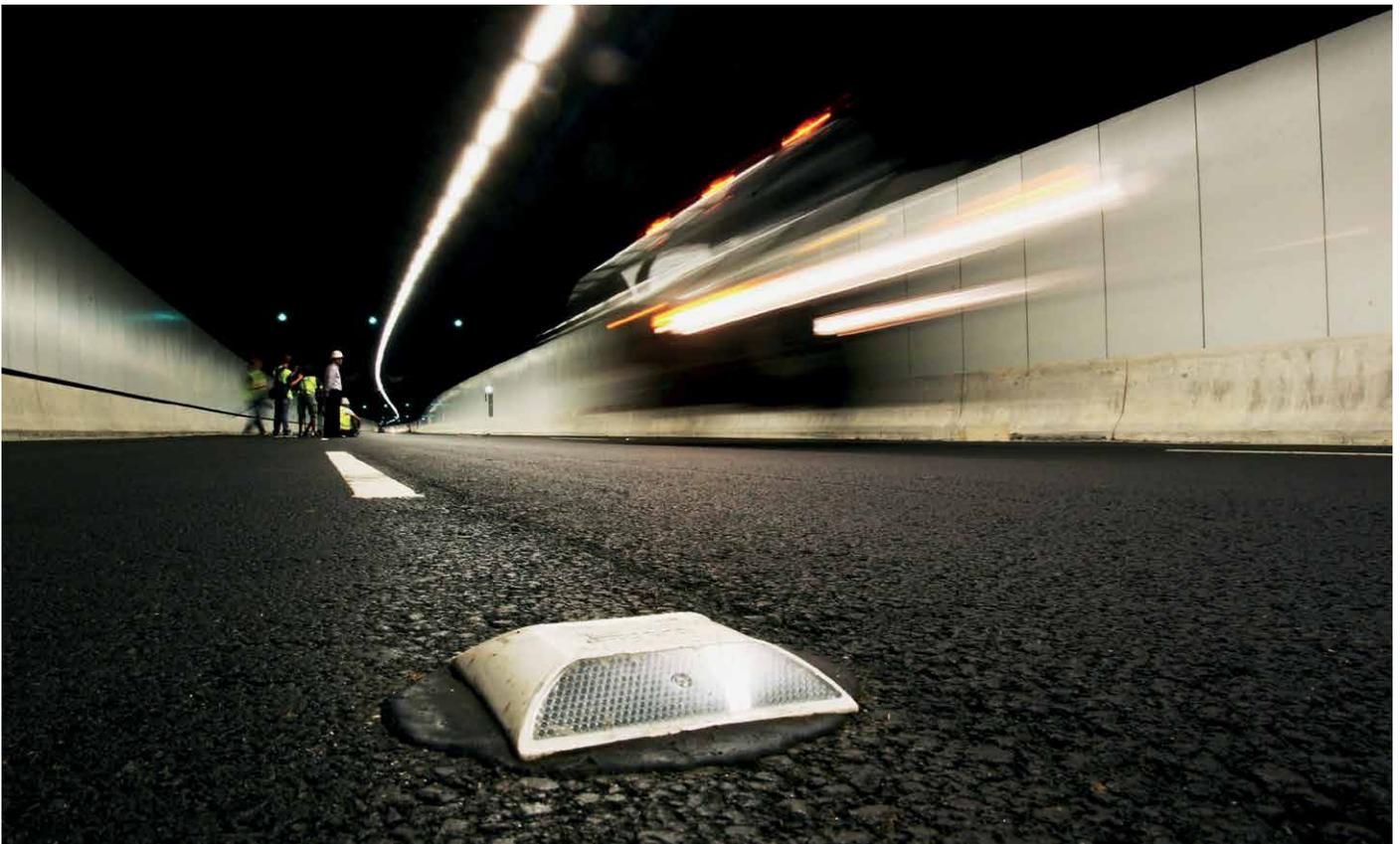
Part of the challenge to overcome, in policy terms, is that road pricing or tolling needs to be understood as not just a way of paying for infrastructure.

37 **Booz Allen Hamilton.** *Study of Successful Congestion Management Approaches and the Role of Charging, Taxes, Levies and Infrastructure and Service Pricing in Travel Demand Management.* Canberra : Council of Australian Governments, 2006.

38 **Lindsey, Robin.** *Do Economists Reach A Conclusion on Road Pricing? The Intellectual History of an Idea.* 2, s.l. : Econ Journal Watch, 2006, Vol. 3.

39 **Bureau of Infrastructure, Transport and Regional Economics.** *Moving urban Australia: can congestion charging unclog our roads?* Canberra : BITRE, 2008. Working paper 74.

40 **Bureau of Transport and Communications Economics.** *Traffic Congestion and Road User Charges in Australian Capital Cities.* 1996.



To be clear, while tolling roads is often justified by governments as helping to alleviate congestion, in reality such roads are typically priced simply to recover full costs. As a report on demand management for Infrastructure NSW in 2012 puts it:

*'Such pricing is incompatible with congestion-alleviation, because full cost recovery is possible only if tolls are set to toll-off sufficient potential users to ensure a wide difference in quality of service between tolled and free-access facilities. Pricing of new roads to alleviate congestion would require low and possibly negative prices.'*⁴¹

That is to say, the purpose of toll roads is not to control congestion but to induce demand so as to pay for them. As Transport for NSW has stressed: 'Although tolling has been used in Sydney to fund motorway construction, its role in addressing and managing congestion has not been widely discussed'.⁴²

Of course, it has been discussed elsewhere and for a long time. Sixty years ago, Nobel-winning economist William Vickrey argued that it was an 'outstanding absurdity' that we applied tolls to roads built to alleviate congestion, particularly by-pass roads, while allowing free access to congested roads. He cited the new road tunnel from the Battery to Brooklyn as an example of absurdity:

*'Since it is a new facility and undoubtedly much more easy and pleasant to use than the old East River Bridges, it must, forsooth, be made to pay for itself by the imposition of tolls starting at 35 cents, the practical consequence of which is to encourage continued heavy use of the Manhattan Bridge for all trips for which the route is shorter than the tunnel, with the result that the streets near the Manhattan end of the bridge are the scene of some of the worst traffic in the city. Marginal cost considerations would call for the collection of a substantial toll (congestion charge) on the old East River bridges, at least during hours of heavy congestion, and a smaller toll or none at all for the tunnel, even though this might mean that the users of the bridges might be 'paying for' the tunnel.'*⁴³

41 **Ergas, Henry and Grieg, David**, *Pricing Congestion in Sydney: Discussion Paper prepared for Infrastructure New South Wales*, April 2012, pxviii

42 **Transport for New South Wales** *NSW Long Term Transport Master Plan: Discussion Paper*, Sydney: New South Wales Government, February, 2012.

43 Vickrey (1955) cited in **Ergas, Henry and Grieg, David**, *Pricing Congestion in Sydney: Discussion Paper prepared for Infrastructure New South Wales*, April 2012, p.78-9

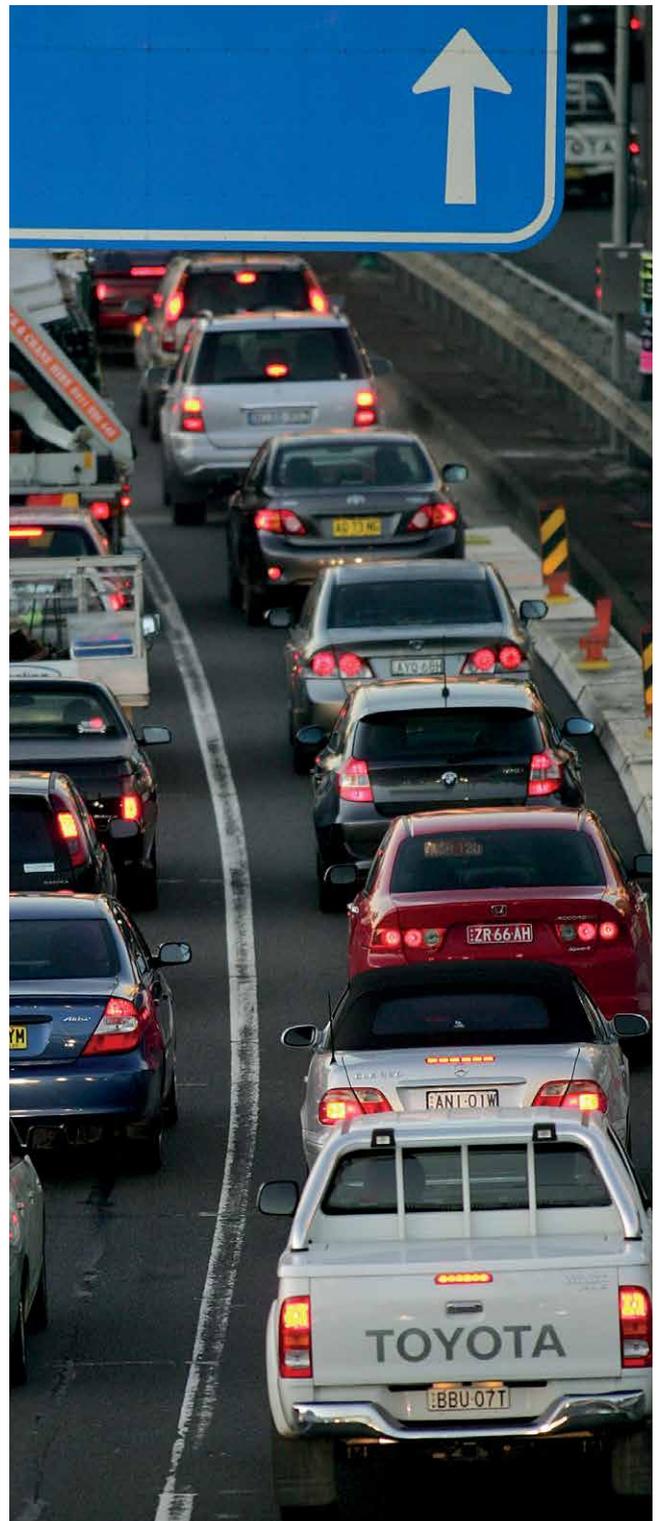
CASE STUDIES

London

London's congestion charge is a single daily fee of £11.50 (AUD 21.50), enabling motorists to enter, leave and re-enter the city between 7.00am and 6.00pm. This charge is designed to encourage commuters to move away from the car and utilise other forms of transport such as public transit, walking and cycling. All revenue from the charge is hypothecated (dedicated) to other improvements to transport across London. Traffic entering the congestion zone has remained 27% lower than pre-charging levels. This equates to roughly 80,000 fewer cars each day, with journey times remaining flat since 2007.⁴⁴

The revenue from the charge has helped to fund improvements in other modes of transport, with cycling levels up 66% since the program's introduction. Bus ridership also grew rapidly when the charges were introduced, with some revenue going towards increased bus services, reductions in fares and improvements to service quality. The large increase in bus ridership could be attributed to people not wanting to pay the charge or from people being enticed by the better service. Either way, the charge is having its desired effect.⁴⁵ At the time of its introduction, the charge was forecast to bring misery to London, with predictions that it would create total gridlock and destroy the city's commercial heart. After more than a decade of the congestion charge being in place, the majority of Londoners support the program, with traffic levels stable and business activity more productive and profitable.⁴⁶

The London experience has also shown decisively that such a regime, while reducing congestion, is also consistent with a high performing economy. This is no surprise when you consider the evidence of the increasingly strong link between the liveability of a city and its productivity in a knowledge economy where quality of life is a key attractor of global talent. Congestion and long commutes undermine a city's quality of life offer and indeed its economy.



⁴⁴ **Transport for London.** *Congestion Charge Factsheet.* tfl.gov.uk/cc

⁴⁵ **Jaffe, Eric.** *The Limits of Congestion Pricing.* City Lab, Nov 29, 2011

⁴⁶ **Bloodworth, James.** *Ten Years of the Congestion Charge: Fewer Cars, Less Pollution and a Positive Impact on Businesses.* Left Foot Forward, Feb 25, 2013

Stockholm

Stockholm's congestion pricing program is a recurring charge rather than a flat daily rate like London. Drivers are charged each time they enter the zone during the day, although the charge is considerably smaller than that of other cities, ranging from €1-2 depending on the time of day.⁴⁷ This system was designed not to deter cars from the city altogether, but rather to more evenly distribute the traffic flowing into the city centre.

Like other cities with congestion charges, Stockholm has seen traffic reduce by 18%, public transport ridership increase by 4.5% and travel times to get into the city during peak hours cut in half. There is also, crucially, a reduction in variability - meaning less likelihood of being caught in unexpectedly long jams.⁴⁸ In addition to these congestion benefits, carbon emissions dropped by 14-18%, environmentally friendly tax exempt vehicle ownership tripled and retailers reported a 6% increase in business.⁴⁹

The Stockholm case study is extremely important when opponents to congestion charges use public opinion as an argument against such charges. When the program was

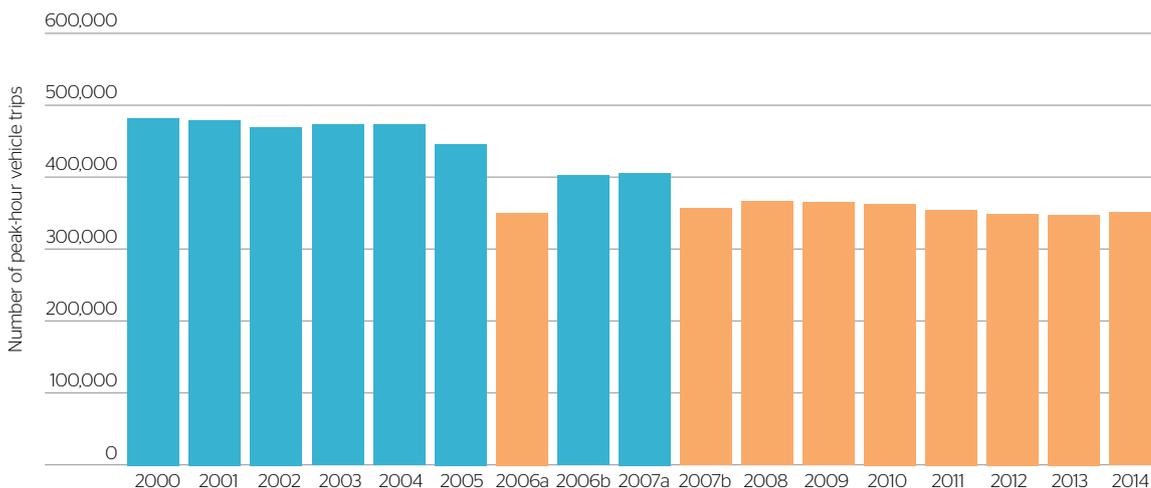
first introduced, roughly 70% of people were opposed to it. By mid-2011, opinion had flipped entirely, with 70% of people now in support of the program. When researchers attempted to find out which drivers had changed their mind, roughly half of all drivers thought they had always been in support of the congestion charge. This demonstrated that drivers' behaviour had changed so thoroughly that they could not recall what their opinion used to be.⁵⁰

The congestion charge in Stockholm was also noteworthy for the manner it was introduced. Trialled in 2006, it was in place for 7 months before being removed for a year while a referendum was held. After a successful referendum was completed, the charge was put back on. The result is a unique opportunity to examine the impact of the charge on congestion - and to test whether removing the charge resulted in a return to increased congestion.

The evidence was clear. When the charge was removed, most of the 20% reduction in congestion was eliminated, with traffic numbers climbing back up. Once the charge was placed back on, traffic numbers dropped again.

Figure 3: The Stockholm congestion charge

Reduced peak travel when introduced (orange) in 2006. When removed (blue) for 12 months, congestion returned, only to be reduced again after the re-introduction of the charge in 2007.⁴⁸



47 Jaffe, Eric. *Traffic Jams, Solved*. City Lab, Dec 14, 2012

48 Jonas Eliasson, KTH Royal Institute of Technology, Stockholm, Presentation at Committee for Sydney's *Online Global Cities Dialogue*, 3 December 2015, <http://www.sydney.org.au/eventsonlinedialoguedemandmanagement/>

49 Peach, Joe. *The Success of Stockholm's Congestion Pricing Solution*. ThisBigCity, Aug 23, 2011

50 Jaffe, Eric. *Traffic Jams, Solved*. City Lab, Dec 14, 2012

Milan

Milan's road pricing program involves charging €5 to enter a portion of the city, known as Area C, between 7.30am and 7.30pm. In late July 2012, the charge was suspended by an Italian court. After 8 weeks, the pricing program was reinstated, and although traffic and congestion shot up dramatically during this period, the difference in traffic figures during these periods created some very compelling data for the benefits the congestion charge is having for Milan, as seen in Figure 4.

The program results in 27,000 fewer cars entering Area C each day, or 14.5% less traffic. When the charge is in place, research shows that most drivers compensate by either taking different routes or travelling at different times.

Commuter routes near public transport displayed smaller traffic changes than those without good access during the congestion suspension. This shows that commuters with good access to public transport are happy to remain out of their car.⁵¹

In addition to the reduced congestion, fewer cars on the road had a considerable effect on pollution in Milan, reducing the PM10 particulate matter by 17%, with an estimated environmental benefit of \$3 billion a year. Over the year, the program generated €13 million, which was reinvested into public transit and bike share programs.⁵²

Figure 4: Road pricing in Milan

Change in number of vehicles entering Milan town centre before, during and after an eight week suspension of road pricing in 2012⁵³



53 **Gibson, Matthew & Carnovale, Maria.** *The effects of road pricing on driver behavior and air pollution.* Journal of Urban Economics, Vol. 89, 2015, pg. 66

51 **Jaffe, Eric.** *Milan Abruptly Suspended Congestion Pricing and Traffic Immediately Soared.* City Lab, Sept 10, 2015

52 **Jaffe, Eric.** *Milan Abruptly Suspended Congestion Pricing and Traffic Immediately Soared.* City Lab, Sept 10, 2015

Singapore

Singapore introduced the ERP (Electronic Road Pricing) scheme in September 1998, replacing the existing ALS (Area Licencing Scheme) which restricted traffic entering certain areas of the city by issuing paper licences, but was inefficient as it required manual enforcement.

The ERP is a versatile charging system which charges vehicles as they pass a control point when entering the Restricted Zone (around the inner city) and along specific sections of high volume roads.⁵⁴ The ERP was introduced as a traffic and behaviour management tool, complemented by the improvement of key public transport alternatives, rather than a revenue generating tool (funds are not hypothecated for transport-related investment).⁵⁵ Pricing for vehicles entering the Restricted zone and other roadways varies according to vehicle type, location of entry and time of day. Over just a two year period from the ERP's introduction in 1998 to 2000, Singapore experienced a 13% drop in morning peak traffic, a 9% drop in off peak traffic, and an 8% drop in the evening peak.

Since its introduction, the ERP has been expanded to include more entry points, and to manage specific peak congestion issues in locations around the city. It is also regularly refined (in terms of pricing and timing) in certain areas in response to local traffic characteristics - with the aim to remain flexible and relevant, whilst maintaining a simple and transparent pricing structure for users.⁵⁶

Demonstrating the potential

While each of the above schemes differ, with London having a more basic area-focussed cordon approach and Singapore evolving in a more sophisticated direction - and none of the above schemes may exactly match Sydney's requirements - the schemes in these cities have shown that important economic efficiency gains can be made by applying even 'simplified' road pricing regimes to manage congestion. We can and must learn from them. Whatever the differences in the structure of their cities and the challenges they face, the existing schemes can help us reduce design risks and costs for any scheme implemented here - notwithstanding that anything planned for Sydney would now benefit from advances in ICT, GPS, satellite communications and associated technologies unavailable previously.

The case studies also demonstrate the potential that road pricing offers for improving network performance by reducing and spreading demand and thus congestion - and for delivering economic benefits including labour market efficiencies and GDP uplift.⁵⁷ It was for these reasons that the first Chair of Infrastructure Australia, Rod Eddington, expressed strong support for road pricing in the infrastructure inquiry he led for the UK Government in 2006.⁵⁸ It is why the Committee for Sydney supports it.

54 **Menon, AP Gopinath & Dr Chin, Kian-Keong**, *ERP in Singapore - what's been learnt from five years of operation?*, ETC, February 2004, <http://www.lta.gov.sg/Itaacademy/doc/ERP%20in%20Singapore%20-%205%20years.pdf>

55 **Dr Chin, Kian-Keong**, *Congestion Pricing Experiences in Singapore* (presentation to International Transport Forum), 2010, <http://www.internationaltransportforum.org/jtrc/RoundTables/RTfeb10Chin.pdf>

56 **Dr Chin, Kian-Keong**, *Congestion Pricing Experiences in Singapore* (presentation to International Transport Forum), 2010, <http://www.internationaltransportforum.org/jtrc/RoundTables/RTfeb10Chin.pdf>

57 **Whitelegg, John**, *Pay as you go: managing traffic impacts in a world-class city*, Eco-Logica Ltd, Lancaster, December 2011

58 **Eddington, Rod**, *The Eddington Transport Study: Transport's role in sustaining the UK's productivity and competitiveness*, HM Treasury, London, December 2006

PRICING SYDNEY'S ROADS: A VITAL CIVIC DIALOGUE – AND A KEY ISSUE FOR GOVERNMENT

The time has surely come for a civic dialogue and new government thinking on pricing Sydney's roads. The Committee for Sydney welcomed the recent innovative work of the NRMA around a new strategic approach to setting road tolls, focusing on road network performance, as a great contribution to that dialogue and as a source of new thinking for government.⁵⁹ Similarly Infrastructure NSW, in their first State Infrastructure Strategy, identified the potential of time-of-day pricing on roads to reduce congestion and fund investment in transport networks.⁶⁰

Detailed work – well beyond the scope of this Issues Paper – is now required to assess the potential options for Sydney. We believe that from an economic efficiency perspective – and one that recognises Greater Sydney's scale and range of congested locations and routes – the optimal road pricing approach would operate on a networked metropolitan-wide basis, involving variable charges. The charges would reflect changes in marginal external congestion costs as the degree of congestion varies over time and across locations. In some cases, prices might also vary between lanes on the same road to accommodate the varieties of road-users. Additionally, as Sydneysiders are now well-adapted to very sophisticated real-time, interactive ICT technology, smart cards and contactless/mobile payment for services – and automatic debits for transport with Opal cards – there is now a socio-cultural context that is ripe for further development into 'pay as you go' road pricing.

Such an approach to pricing can help to manage finite roadway capacity, moderating demand through the use of pricing, based on location, time of day, and traffic conditions. Variable tolls that are higher at peak times can reduce traffic congestion by shifting transportation away from single-occupancy vehicles, out of peak travel periods, and to less-congested roads or modes of transportation. Given the relatively low costs of designing and implementing a smart road pricing scheme, such demand management is also obviously cheaper than building new roadway capacity and will reduce wear and tear – and thus costs of maintenance – on existing infrastructure. According to one US estimate, widespread use of so-called 'value pricing' methods such as variable tolling would reduce the amount of capital investment needed to sustain the performance and condition of the highway system by nearly one-third.⁶¹

Such variable or 'value pricing' is widely used to manage demand for other classes of infrastructure such as water and power, where prices may be higher during on-peak periods or as usage increases. Indeed residents of NSW are well versed in peak and off-peak costs for electricity and moderate their usage accordingly.

Phasing in?

However, while the ideal system would seem to be a dynamic variable pricing regime at a Greater Sydney scale as outlined, it may be necessary to review the possibility of phasing in such a network wide system as recommended in the 2003 NSW Ministerial Inquiry report (which also proposed re-negotiation of existing tolling arrangements: see below). Phasing-in congestion pricing in practice may mean developing a hybrid model with variable cordon-based pricing, involving geographically dispersed cordons, plus variable pricing of selected links or corridors, with cordoned areas. Later, coverage would be expanded through application of GPS technology to support network-wide variable congestion pricing. Although the Committee has not thus far conducted targeted research into where the cordons and links for such a phased in approach might be located, potential focuses are Inner Sydney, including the CBD and Central Station precincts, other key employment centres such as Macquarie Park, North Sydney, North Ryde and Parramatta, and the other highly congested transport corridors of Sydney identified by Infrastructure Australia.⁶²

A precedent for an evolutionary approach to congestion pricing has of course been provided by Singapore. It started with a paper-based area pricing regime, moved to variable pricing of crossings of a single cordon and selected arterial roads, based on wireless technology, and then to differential pricing of three adjacent zones within the original cordon and refinement of pricing coverage of arterial roads.

Whatever form a road pricing or congestion charge regime takes, we are of the view that to ensure that it remains efficient, effective and strategically coherent, road tolls and congestion pricing across Greater Sydney should ultimately be integrated into a single system. We further suggest that prices in such a regime could be set by the Independent Pricing and Regulatory Tribunal (IPART) or another similar body, in line with dynamic demand for road space. This is to ensure a transparent and efficient pricing regime, removed from politics. It will also ensure that price levels don't erode over time, as has happened in London for political reasons, leading to some mitigation of impact.

59 **NRMA**. *Improving the Performance of Sydney's Road Network*. Houston Kemp Economists 2015.

http://www.mynrma.com.au/media/Toll_Roads_NRMA_report.pdf

60 **Infrastructure NSW**. State Infrastructure Strategy 2012 – 2032. http://www.infrastructure.nsw.gov.au/pdfs/SIS_Report_Complete_Print.pdf, pg. 91

61 **Congressional Budget Office**. The Highway Trust Fund and Paying for Highways, 2011. <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/121xx/doc12173/05-17-highwayfunding.pdf>, p. 14.

62 **Infrastructure Australia**. Australian Infrastructure Audit Report Key Findings, 2015. <http://infrastructureaustralia.gov.au/policy-publications/publications/files/Australian-Infrastructure-Audit-Key-Findings.pdf>

Getting public buy-in: Ring-fencing road pricing and addressing equity

Public resistance to and a lack of understanding of the benefits of road and congestion pricing are likely the most challenging obstacles to implementation – along with suspicion of a government cash grab. Plain and direct communication on the benefits of road pricing for individuals – including time savings for travellers, new revenues to invest in travel alternatives and the health benefits accruing to those who shift from car use to public transport or active transport modes – are essential to the success of network pricing.

When variable tolling started in Lee County, Florida, the slogan ‘avoid the rush, pay half as much!’⁶³ was advertised to promote taking trips off-peak. Extensive communication regarding the phase-in schedule for pricing, the pricing structure, and the application of revenues and transport alternatives is crucial. There is also an opportunity with road pricing to use the revenue raised to rationalise existing taxation on motorists – with a discussion needing to be had on whether a road pricing regime could actually deliver its benefits and changes to behaviour while being revenue neutral overall.

Another example is the Move NY campaign for a systematic and strategic road pricing regime for Manhattan. Move NY is an impressive coalition of business associations, city government leaders, transportation advocates, churches and unions across the 5 boroughs, building broad based support to solve New York’s congestion problems and bring new investment for better transport options. It advocates for hypothecating the revenue generated to public transport and other transportation infrastructure – funding projects and improvements across the 5 Boroughs, not just Manhattan.⁶⁴

Off peak pricing by shifting demand can also make night time deliveries and truck movements more viable. This will not only take trucks off the road at peak times, but also lower the cost of doing business and make our economy more productive.

As we have noted, there may be some public suspicion that revenue raised through transport charges will be subsumed into general revenue. So, from both the perspective of sound policy and good politics, the revenue raised from road pricing and congestion zones should be used to fund road maintenance, new roads where the need is established through an evidence based mode-neutral form of project appraisal, and also public transport.⁶⁵ The hypothecation of revenue for investment in sustainable transport objectives – public transport, walking and cycling – is crucially important and must continue. It encourages a higher level of public support than would be the case if it were ‘just another tax’. The Committee has been a strong supporter of the NSW Government’s big program of public transport investment. However, as pointed out in our 2014 submission to Rebuilding NSW,⁶⁶ the need to reinvest in public transport goes well beyond the resources liberated by the partial leasing of the electricity network businesses (poles and wires) and will require access to new sources of funding and finance going forward. These must include innovations around road pricing and new user charges, as well as value capture regimes, where government takes its share from the value created by government infrastructure investment.⁶⁷

It is often forgotten that in his first budget as US President, Ronald Reagan, hardly a fan of tax increases, raised the gas tax – but crucially linked the funding to improvements in both roads and public transport.⁶⁸ In order to demonstrate that road pricing is clearly a mechanism to improve our transport system – rather than a revenue mechanism – having a clear and transparent commitment that funding from road pricing will be reinvested back into the broader transport system is vital.

This will enable improvements to our road system that will have an impact on amenity, but also provide funding for public transport options that provide alternatives for travellers.

63 **Smart Growth America**, *The Innovative DOT Focus Area 3: Pricing*, 2015, http://www.smartgrowthamerica.org/documents/the-innovative-dot-2_focusarea-3.pdf, pg. 71

64 **NYC Smart Participation**, <http://nyc.smartparticipation.com/proposals/nyc-congestion/discussion/4-move-ny-fair-plan#nid-84>; **Move NY**, <http://iheartmoveny.org/>

65 **Productivity Commission**, *Public Infrastructure*, Inquiry Report No. 71, Canberra, 2014.

66 **Committee for Sydney**, Submission to Rebuilding NSW, 2014, <http://www.sydney.org.au/wp-content/uploads/2015/10/CFS-Submission-on-Rebuilding-NSW.pdf>

67 **Committee for Sydney**, *Issues Paper 11: Are we there yet? Value capture and the future of public transport in Sydney*, December 2015, <http://www.sydney.org.au/wp-content/uploads/2015/10/CFS-Issues-Paper-11-Are-we-there-yet-Valuecapture-and-the-future-of-public-transport-in-Sydney-2015.pdf>

68 **Jaffe, Eric**, *Once upon a time it was possible to raise the gas tax*, CityLab, May 2015, <http://www.citylab.com/politics/2015/05/once-upon-a-time-it-was-possible-to-raise-the-gas-tax/394409/>

A city for all: Improving equity

One of the common critiques of road pricing schemes relates to 'vertical' equity – that is, equity for low-income people, who are more likely to live further away from jobs and would be penalised through a scheme that charged per kilometre driven, or where tolls make up a larger portion of their income.

It is important at the outset to recognise that our current system of funding roads is very vertically inequitable – fuel taxes especially hit those who travel furthest and registration fees make up a larger portion of low-income people's budget. Similarly the cost of congestion disproportionately impacts those living furthest from jobs. Introducing road pricing will not increase the overall vertical inequality of our transportation system.⁶⁹

However, it is possible to moderate or even eliminate the vertical inequity of road pricing. Quicker travel through reduced congestion in and of itself moderates the impact. Similarly, hypothecating revenue raised from road pricing to transport projects (especially public transport) delivers the largest proportion of its benefits to transport-disadvantaged people. The implementation of congestion zones may also enable the removal of parking levies, as congestion zone charges provide a more equitable system of pricing the demand for city streets. Similarly, the pricing of roads that have previously not been tolled could be offset by reductions in vehicle registration costs. Finally, if inequity remains, some jurisdictions have used targeted rebates to eliminate any residual impacts.⁷⁰

Need for political leadership and community maturity

As we have stressed, the challenge for managing congestion is not a technical one, as the technology and skills exist to deliver a demand management approach. The challenge is one of political leadership and community buy-in and, as in Los Angeles, Sydney's stakeholders and leaders must 'summon the political willpower to face a tough decision'.⁷¹ The question the Committee for Sydney asks of all politicians, and indeed all Sydneysiders, is: *will we pursue road pricing to manage demand for peak-hour automotive travel, or will we instead simply allow congestion to worsen in the coming decades by adopting purely supply side solutions?*

The NSW Government's *Premier's Innovation Initiative* and its crowd-sourcing of policy ideas to deal with congestion was a step in the right direction. Business-as-usual will simply not deliver the city we need. A comprehensive strategy for managing congestion is an obvious and urgent game-changer for Sydney. Road pricing has to be at the heart of that because nothing else works.

The challenge is that politicians remain under pressure from electorates and media to invest in new infrastructure even when existing infrastructure assets have not been sufficiently sweated. We must change the discourse across politics, media, the public sector, the business community, and the public. The technology exists to enable us to utilise our roads system far more effectively, but the political will to combine digital management of our transport systems with effective and equitable charging for road use does not. The Committee's purpose in publishing this Issues Paper and in taking this position on charging is to promote the necessary civic dialogue and to support bold reformers in leadership roles who know that demand for road usage in our cities can never be met by supply-side initiatives in a world of constrained resources and space. A new approach to congestion management is needed.

A debate on road pricing to watch: Vancouver

In looking at the political reality of road pricing in Sydney, we should consider Vancouver, which has long struggled to fund its transportation network and battled congestion. Between 2010 and 2013, TransLink, Vancouver's public transport authority, attempted to raise revenue through a vehicle levy, only for it to be rejected by the British Columbia government. This has resulted in the authority holding significant debt, and struggling to maintain and expand its network. In 2015, it championed a local referendum on raising sales tax to fund their operations, which was rejected by 62% of voters.

Most recently, Vancouver's local governments have banded together to propose a comprehensive road pricing strategy to reduce congestion and fund TransLink. The government is insisting that any new road pricing must first go to a referendum.

This year will see the political challenges of gaining public buy-in for road pricing playing out in Vancouver. While the commitment to pricing from the city's local governments is crucial, overcoming public resistance to additional taxes will not be easy. Learning lessons from this process will be vital for Sydney, as we discuss and debate a comprehensive road pricing system for the city.

69 **Taylor, Brian D.** *How Fair is Road Pricing? Evaluating Equity in Transportation Pricing and Finance*, Bipartisan Policy Center, 2010.

70 **Litman, Todd.** *Using Road Pricing Revenue: Economic Efficiency and Equity Considerations*, VTPI, 2011, <http://www.vtpi.org/revenue.pdf>, pg. 5

71 **Sorensen, Paul, Wachs, Martin et al.** *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, RAND Corporation, 2008.

A new approach to infrastructure appraisal?

A key part of the new approach relies on mode-neutral evaluation, appraisal and funding of transport projects or investments. Options such as improvements to existing transport infrastructure, public transport investments, technology improvements and demand management initiatives may be less costly and more effective solutions to transportation problems than new capacity projects. However, our current approaches to funding projects and the appraisal methods used often lead to a bias toward delivering new road capacity.

One source of this tendency is clearly Federal Government funding being targeted at roads rather than being mode-neutral, due to an historical distinction between state responsibility for public transport and federal responsibility for roads and highways. This clearly impacts on the appraisal process – an example of the vertical fiscal imbalance between the states and the Commonwealth, which is effectively distorting our cities' choices and obstructing effective responses to the challenges of city management. A linked structural issue inhibiting a multi-modal approach is the existence of road agencies (separate from other forms of transport) with their own Ministries at both state and federal levels. This siloed approach ignores the integrated nature of the transportation system in cities and exacerbates the highway and road focus in transportation funding. Such segregation of funds by mode does not encourage states to prioritise projects that best serve the system, or indeed the city, as a whole; rather, it creates budget biases and potentially false choices.

Although the Committee believes the Australian Government should adopt a more mode-neutral investment approach in our cities, the NSW Government can itself decide to allocate funds efficiently based on system-wide needs and priorities now by pooling resources into a multi-modal fund, and then distributing funds using mode-neutral appraisal criteria. This means that no option – whether road building, improving existing infrastructure, public transport or demand management – would be ignored or favoured in the project selection process. NSW Government priorities informing such a process for Sydney might be congestion management, land use and transport integration, housing supply and densities, economic development, job creation, health objectives, community safety, and the prosperity and economic integration of Western Sydney. These are the broader success criteria for delivering *A Plan for Growing Sydney 2014* (the Sydney Metropolitan Strategy) rather than the usual mode-based and narrower criteria conventionally used in transport evaluation. Such an approach would include a system of strategic transport modelling, able to identify essential city shaping transport projects.⁷²

Critically, the infrastructure appraisal process would give due weight to road pricing strategies and investments on existing road infrastructure, rather than the current privileging of new infrastructure projects. Therefore a level playing field needs to be established in the appraisal process not just between investment proposals for different modes but also for proposals which seek to sweat existing infrastructure more efficiently rather than build anew. This issue of mode-neutral and strategic appraisal methods – which focus on identifying the right projects to deliver the best city outcomes – will be examined in more detail in a future Committee for Sydney Issues Paper.



⁷² National Transport Modelling Working Group. *Critical Review of Transport Modelling Tools*. Malvern: Sinclair Knight Merz, 2009.

CONCLUSION



Sydney needs:

- a better understanding of congestion to inform infrastructure choices;
- a more informed public debate on the ways to tackle congestion;
- a strategic system of effective road pricing/congestion pricing for the existing network and not just tolling for new roads;
- a more integrated approach to land-use and transport planning as envisaged in *A Plan for Growing Sydney*;
- a multi-modal or mode neutral approach to project evaluation and appraisal;
- alignment of Federal and State transport policies and investment options, with Federal funding allocated multi-modally as required to maximise urban productivity; and
- better alignment between *A Plan for Growing Sydney* and infrastructure planning and investment.

Our key recommendations

An inquiry into road pricing / congestion charging mechanisms

The Committee's central recommendation is that the NSW Government should establish an inquiry into the range of potential road pricing or congestion charging mechanisms to determine what regime would be appropriate for Greater Sydney. While the Committee has identified what we think of as the right direction of travel, the research to decide which road pricing strategy or mix of strategies will work best in Sydney needs to be undertaken by Government. Before any road pricing scheme can be progressed there is a great deal of work to be done. There are a number of options and each has to be tested on technological robustness, financial viability, revenue generation potential, economic benefit and social impact/equity outcomes.

We need to robustly analyse various road pricing strategies to determine which will best raise revenue for investment in mode-neutral transport projects, while effectively reducing congestion through behaviour change.

For example, it may be appropriate to limit additional revenue raised in order to maximise the reduction in congestion. Similarly, modeling may show particular models of demand management are more effective at changing behaviour than others – or that equity issues are addressed more effectively through one particular model.

We must also examine how best to govern new road pricing schemes, taking issues of equity and transparency into account. Whether through IPART or a similar body, getting the governance right, ensuring ring-fencing is robust and revenue is appropriately allocated to transport projects is vital – before a single dollar is raised.

The Committee believes that the NSW Government, which has embarked on the biggest investment program in both roads and public transport in decades, understands these issues and is clearly committed to policy innovation and institutional reform for Sydney. What may hold it back is a natural concern that the community of Sydney may not share its ambition or embrace the true costs of managing Sydney's growth. This is why we have decided to make this intervention now. Sydney needs some 'game-changers' if our city's growth is to be managed effectively: business-as-usual will simply not deliver the city we need.

The evidence is clear: 'any package of reforms that does not include pricing strategies will not achieve lasting reductions in traffic congestion'.⁷³ While there are many other methods that must make up part of our response to solving congestion, road pricing is the key long-term, effective measure to reduce congestion on our roads. Moreover, only via a road pricing regime where prices would vary over time, across the network and between vehicle types can we change behaviour and reduce traffic at peak times – and avoid the induced demand problem.

Dealing with existing tolls

Implementation of congestion pricing in Sydney would clearly necessitate dealing with existing tolling arrangements with private operators. We agree with the 2012 report prepared for Infrastructure NSW on demand management that an appropriate approach would be to determine the congestion pricing regime 'as if the tolling arrangements did not exist, and then re-negotiate the tolling agreements before implementation of congestion pricing'.⁷⁴ As the report goes on to state, 'profit-neutral "shadow tolls" could be paid to the private operators by government at rates that took into account the effects of variable congestion prices borne by users of those road segments'.⁷⁵ While such an approach would require a radically different kind of public private partnership, and would fundamentally change the market for toll operators, it is unavoidable if congestion management at a network level across Sydney is to be successful. Therefore, our second recommendation is for the NSW Government to review the implications of a strategic road pricing regime for the current toll schemes across Sydney and tolling arrangements for any major road or freeway schemes currently being planned.

An inquiry by the NSW Government into the range of road pricing mechanisms best suited for Greater Sydney, combined with a review of the implications for current and planned toll schemes, is the game-changer needed to transcend short-term electoral considerations, ideology or sectoral self-interest.

It requires transport planners, traffic managers and infrastructure providers to have more integrated thinking across their professional silos as part of a multi-modal, cross-government approach to congestion. There is a vital need for road pricing to be embedded in an overall – and cross government – approach to spatial planning and the location of housing, employment and services, and broader traffic reduction initiatives and the vigorous promotion of walking and cycling. It requires above all understanding from the wider community of Sydney of the challenge ahead. Together we need to create a balanced and informed dialogue about congestion which is evidence-based, learns from modern, global best-practice. We can do this – and we must.

73 **Sorenson, Paul, Wachs, Martin. et. al.**, *Moving Los Angeles: Short-Term Policy Options for Improving Transportation*, RAND Corporation, 2008, pg. xviii

74 **Ergas, Henry and Grieg, David**, *Pricing Congestion in Sydney: Discussion Paper prepared for Infrastructure New South Wales*, April 2012, p.79

75 **Ergas, Henry and Grieg, David**, *Pricing Congestion in Sydney: Discussion Paper prepared for Infrastructure New South Wales*, April 2012, p.79



The Committee for
Sydney

The Committee for Sydney would like to thank members of our Transport Taskforce and Committee member NRMA for their advice and input into this paper.

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The Committee for Sydney

Level 10
201 Kent Street
Sydney
NSW 2000

sydney.org.au
[@Committee4Syd](https://twitter.com/Committee4Syd)
committee@sydney.org.au
+61 2 9320 9860

“The Committe for Sydney is a fantastic body adding to public debate in the city. It is exactly the organisation it needs to be – engaged, constructive and challenging.”

The Hon. Mike Baird MP, NSW Premier