

Why Road Pricing in Australia - Contrasts with International Experience

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Introduction and Summary

Road pricing has long been recognised as having potential for the efficient management of traffic demand. It is increasingly being given serious consideration around the world, although discussions on the topic stretch back to the 1960s. Unfortunately, car users and politicians do not generally share this view; voting power and the expected electoral backlash from increasing prices have generally prevented the introduction of road pricing in cities. (The other role of pricing, as a funding mechanism, is not our concern in this paper.)

It is in cities, of course, where the debate lies. How do Australian and New Zealand cities compare with other cities in respect of the applicability of road pricing policies? We attempt to throw some light on this question in this paper, and consider some of the major policy implications. The cities which we shall compare are as follows.

Sydney and Melbourne: the two largest Australian cities, whose published transport strategies acknowledge the role of road pricing in demand management.

Auckland and Wellington: the two largest New Zealand cities. Both have very recently published transport strategies ('Regional Land Transport Strategies') which acknowledge a role for road pricing in future. In both cities it is anticipated principally to have a funding role, while in Auckland its demand management function is also clearly acknowledged.

London: the largest UK city, where road pricing has been on the agenda for a number of years. A major study was shelved by the then government in 1995. Powers to implement road pricing have since been given to the newly-formed Greater London Authority, but it remains to be seen whether its leader, the Mayor of London due to be elected shortly, will pursue the policy.

Amsterdam: road pricing was a key plank in The Netherlands government policy in the 1980s until it resulted in the collapse of the government. While in the late 90s it is again on the agenda, the possible implementation has continued to attract serious criticism in parliament and society. Nonetheless, current policy is that it should happen after 2000.

Stockholm, Sweden: where advanced plans to introduce road tolling collapsed in 1997 due to high costs and resident protests.

Trondheim, Norway: its Toll Ring, which opened in 1991, being one of the first functioning road pricing projects with peak surcharges for demand management (there are also rings in Oslo and Bergen whose objective is primarily funding). It has been argued that road pricing has been easier to introduce in Norway because of a large number of tolled tunnels and bridges made necessary by Norway's rugged topography.

Hong Kong: where electronic road pricing is again being studied and trialed (following previous work in the early 1980s which was not implemented).

Singapore: in 1998, an electronic road pricing system was introduced around the CBD and on major expressways, replacing the previous Area Licensing and Road Pricing Schemes. The current scheme is under review.

Tokyo: where traffic densities are highest but, apart from high toll charges in main corridors and strong car parking laws, there is little prospect of road pricing being implemented in the near future.

In the remainder of the paper we compare these cities on a variety of characteristics which may be related to the applicability of road pricing policies. The statistics in the paper are drawn from a variety of sources: some are reliable and consistent but others may not be. We believe however, that they are sufficiently accurate for our purposes, but we would advise against quoting them outside the context of this paper.

Topography

City topography (Table 1) can create transport problems by necessitating high development densities or constraining the capacity of transport corridors. Congestion is exacerbated by traffic flow constraints created by natural barriers, city topography and the narrow streets of old cities.

Table 1 Topography of the Cities

City	Topography
Sydney	The CBD is surrounded on 3 sides by water, leading to heavy congestion on all CBD approaches and especially on the two harbour crossings.
Melbourne	Although the River Yarra runs immediately south of the CBD, there are no significant topographical constraints for this city located on a flat plain.
Auckland	The central area of Auckland is the 'Isthmus', on which is located the CBD; this is surrounded by water and the bridge crossings are the focus of congestion, most notable of which is the Auckland Harbour Bridge.
Wellington	The hilly, earthquake-vulnerable region severely constrains the capacity of the major transport corridors.
London	The River Thames bisects London on an East-West axis and the many river crossings are a focus of congestion, but congestion is also widespread in the narrow streets of the old central and inner areas.
Amsterdam	The Netherlands is one of the smallest European countries with a very high population density and its sandy terrain is a constraint on the provision of transport links. In the centre of the old city of Amsterdam, the capital, the rings of canals and narrow streets inhibit movement.
Stockholm	Stockholm is a city of islands and bridges.
Trondheim	Suffers from the space constraints of an old city not designed for the car.
Hong Kong and Singapore	Both are islands with constrained land areas and very high population densities. In the case of Hong Kong, the harbour crossing from the main island to Kowloon and the New Territories is a focus of congestion.
Tokyo	Constrained land area with exceedingly narrow residential streets and very high population densities dominate the city; river crossings and Tokyo Bay restrict travel, particularly from the South and East.

Of the cities in our Region, Melbourne is the least affected by these constraints, while Auckland, Wellington and Sydney have significant topographical constraints.

Demographic Comparisons

The Oceanic cities (Table 2) have the lowest population densities, the New Zealand cities being particularly low, while the other Asian cities exhibit the highest densities. Low population density does not favour public transport services and, as expected, the level of car ownership is consequently highest in the Oceanic cities.

Table 2 City Demography and Car Ownership

City	Population (m)	Density (persons/hectare)	Car Ownership (cars/head)
Sydney	3.9	17	0.55
Melbourne	3.4	15	0.60
Auckland	1.2	5	0.51
Wellington	0.4	6(1)	0.53
London	7.0	42	0.34
Amsterdam	1.1	49	0.30
Stockholm	0.9	53	0.41(2)
Trondheim	0.14	5	0.5
Hong Kong	6.7	300	0.08
Singapore	3.5	87	0.2
Tokyo	8.2	104	0.34

(1)Wellington City, population 160,000; (2) Sweden, 1994.

The Use of Public Transport

Of the Oceanic cities, all but Auckland have strong rail-based public transport networks (Table 3) and have central areas which are a focus of employment and other activities, for which reason public transport is a significant mode for transport to the CBD, especially in Sydney. Nonetheless, the higher density, lower car ownership European and Asian cities have higher overall public transport usage than the Oceanic cities. The weak central area of Auckland, with just 14% of city employment, dispersed work patterns, low population density and very limited rail network account for its very low share of travel by public transport. Only 11% of Sydney's regional employment is located in the CBD, accounting for the low overall public transport share for commuting.

Table 3 The Use of Public Transport

City	% of Commuting by Public Transport	Public Transport Commuting to CBD (%)
Sydney	16%	78%
Melbourne	25%	50%
Auckland	7%	16%
Wellington	18%	32%
London	40%	80%
Amsterdam	25%	45%(1)
Stockholm	55%	-
Trondheim	-	-
Hong Kong	74%	-
Singapore	66%	70%
Tokyo	80%	90%

(1) In addition, 30% commute by bicycle.

Car Use Costs

Statistics on the costs of using the car in the Australasian cities (Table 4) suggest that fuel prices and car parking charges may generally be lower and road speeds faster than the other cities, making the car a more attractive mode in these cities. As might be expected, road speeds in Sydney are lower than the other Oceanic cities.

Table 4 Car Use Costs

City	Price of fuel (US cents/litre)	CBD All Day Public Parking Charge (US\$)	Average road speeds in am peak (km/hr)
Sydney	61	10	34
Melbourne	61	8	37
Auckland	40	-	40
Wellington	40	4	39
London	101	50	25
Amsterdam	104	20	-
Stockholm	108	-	-
Trondheim	109	-	-
Hong Kong	45	27	25(1)
Singapore	109	5	32
Tokyo	81	-	-

(1) Hong Kong Island

Transport Strategies in New Zealand and Australia

The transport strategies for the four Australasian cities share some basic philosophies:

- (i) recognition of the importance of the relationship between land use and transport;
- (ii) infrastructure investment in both public and private transport;
- (iii) emphasis on public transport, cycle and walk as a means of encouraging people from cars (although there may remain a greater level of investment in roads, to service the larger car user market);
- (iv) acknowledgment of demand management, and a possible role for road pricing;
- (v) acknowledgment that the price of car travel may not reflect its true cost and may thus distort competition with public transport;
- (vi) and preference for strategies which encourage reductions in car use ('carrots') over aggressive pricing or restraint strategies ('sticks').

Particular features of the strategies of the individual cities are as follows.

Wellington: with only a small population growth rate, the transport issues may be capable of resolution without using road pricing as a demand management tool; infrastructure costs being high in this difficult terrain, road pricing may have a role for generating the required funding and a levy on CBD parking is also proposed.

Melbourne: low population growth and increased car use are expected to increase traffic levels by 30% between 1996 and 2010. The current strategy (which is likely to be reviewed by the new Labour government) focuses on the role of transport in serving the economy of Victoria and is concerned with maintaining and increasing accessibility and efficiency (in which respect public transport was recently deregulated). There being few natural barriers to movement, Melbourne's traffic problems are not of the magnitude of other cities and in consequence the strategy does not emphasise restraint. Reference is made to policies for encouraging a reduction in car travel demand and increasing public transport patronage by 50% over a 15 year period. The new government is

expected to place a stronger emphasis on investment in public transport, but has also indicated its dislike of road tolls.

Sydney: traffic levels could increase by as much as 20% over the next 20 years, exacerbating the already serious traffic problems. Integrated transport and land use is the strategic focus. There are major road improvements planned, the completion of the orbital route and a cross city tunnel, a major new programme of bus-only transitways in western Sydney where most employment growth is expected, and heavy rail improvements. The emphasis on improving public transport services is the first element of the plan to reduce car dependency. The second will develop from a community debate on demand management initiatives in which the price and availability of parking and road pricing will feature. Unlike the other Australasian cities, Sydney has already established a precedent for road pricing with new freeways being tolled through private sector build and operate schemes.

Auckland: the combination of low population densities, a restricted rail system, a weak CBD, a freeway network which includes the Harbour Bridge and which has the CBD as its fulcrum have created high levels of road traffic congestion on the motorways radiating from the central area. These problems will be exacerbated by the expected 30% population increase in the next 20-25 years. There is a strong focus on improving public transport in the strategy and studies of a number of radial corridors are currently underway, and there are plans for increased bus priority measures. Nonetheless, significant road-building will also be needed to cater for the mainly car-borne population. The natural barriers around the Auckland central area ('Isthmus') provide convenient road pricing locations and this is currently under active study by Auckland Regional Council. Road pricing could also reduce the need for a second harbour crossing, a controversial scheme with high capital and environmental costs. The investment plans imply a higher level of transport funding than hitherto, and diverse funding sources, include road pricing, are discussed in the strategy.

In general these strategies may be fairly described as 'integrated'. However, while there is interest in pricing, and in reducing car use and increasing that of public transport, all of the strategies include major road-building. Nor can it be said that any of these strategies exhibit a strong commitment to the restraint of car users, at least as evidenced by any firm schemes of this kind.

The Impacts of Road Pricing and Public Opinion

It is generally found that car users react adversely to pricing proposals but are in support of improved public transport. In the course of seeking to understand the results of evaluations of possible road pricing schemes in Auckland, the following conclusions were drawn:

- (i) most of the scheme benefits would accrue to the government via increased revenues from tolling;
- (ii) car users as a group were usually disbenefited, in that the value of the time savings due to reduced congestion was less than the overall payments on tolls;
- (iii) car users who paid tolls were heavily disbenefited, as were car users who diverted to other modes, while car users who did not go through the toll points on average benefited from reduced congestion on routes where traffic reduced as a result of tolling elsewhere.

These findings are consistent with both theory and other studies. The rejection of tolling by car users thus naturally follows from its impact on them. The discussion of the benefits to residents/voters of tolling then turns on how the government uses the extra revenues. Where tolling is used simply to finance new roads and the toll is on the new route, then the revenue is directly and transparently applied to compensate the car user. This same concept is often used to suggest that the impacts of road user charging may be diminished by re-investing the revenues in transport improvements.

Conclusions

It is not in question that road user charging can be an effective element in demand management schemes. The history of the concept is however bedevilled with failure to implement and rejection by voters. There are also detailed technical problems of implementation relating to, for example, equity and the location and method of charging. Given these difficulties, we have sought to investigate how Australasian cities are positioned for taking such schemes forward.

We can quickly discount the second largest cities in Australia and New Zealand (Melbourne and Wellington) which appear very unlikely to take road pricing forward as a means of demand management. They do not have the need and in Melbourne there is no political support.

The two largest cities, Sydney and Auckland, are however considering road pricing, albeit in some fairly distant future. Undoubtedly they suffer from severe traffic congestion generated by their size, structure, high car ownership and topography. They also share characteristics which may militate against achieving implementation include:

demographics: low population density, high car ownership and car dependence;

employment: dispersed in both cities, not concentrated in the CBD;

use of public transport: in overall terms low in both cities related to their dispersed development, the non-CBD employment places attracting low public transport usage; also public transport has a very low share for commuting to Auckland's CBD;

costs of car use: low fuel costs and relatively high road speeds do not suggest that car travel has yet reached the level of unacceptability that applies elsewhere.

Our contention is that road user charging is the most disliked of demand management policies. This means that it would be most natural to first apply other more acceptable restraint and pricing policies in seeking a means of managing traffic demand. Such policies would include the pricing and supply of parking, fuel taxation, strong control of traffic regulations (speed limits, parking etc as in Tokyo, London, Amsterdam and elsewhere), traffic management measures, public transport priorities, control of road supply etc. Until road users accept that restraint is required and become used to its imposition, it seems that it will be difficult to persuade them of the benefits of road user charging. Equally, if politicians are unwilling to impose even these lesser traffic controls, then it must be doubted whether they will be prepared to impose pricing policies, especially as there is international experience of the strength and effectiveness of voter reaction. We are not convinced that such a context has yet been established in either Auckland or Sydney, although the wide use of tollways in Sydney is important and, if average traffic speeds are a reliable indicator, Sydney's road conditions are the worst of the four Oceanic cities..

Road users as a group are disbenefited by road pricing, and their reaction to the policy is consistent with this. There must therefore be overriding wider community benefits related to, for example, economic growth, sustainability and the environment, if road user charging is to be accepted and implemented. These wider benefits must also be apparent to the resident population and voters. Again, we doubt that such a consensus position is likely to be reached in these cities in the foreseeable future.