

2005 AITPM NATIONAL CONFERENCE
Priority Treatment: Juggling Competing Demands



AITPM 2005 Conference

Road Pricing – Saviour for Livability?

Road Pricing – Saviour for Livability? (1)

Introduction

- Is there a place for road pricing (a travel demand management measure) within our communities?
- Would road pricing provide livability benefits?
- Is our current “predict and provide” approach sustainable?
- Can road pricing help redress the current imbalance in mode share?

*“...As the instance of jams grows around the developed world, more and more people are choosing to voluntarily disable themselves for many hours per week, preferring to sacrifice the use of the very legs God gave them in exchange for the illusion of carefree mobility...”
(Elton, 1991)*

- Can road pricing help in reducing our reliance on the private vehicle?



Road Pricing – Saviour for Livability? (2)

Road pricing a definition:

- Road pricing is essentially the “user pays” principle applied to road infrastructure
- Related to the economic theory of “supply and demand”
- Many varieties of road pricing in place throughout the world
- Basic principle is that each road user should be charged for the actual cost of using the road system
- Aims at achieving a price that reflects the individual road users impact on all other users (society and the environment)
- If prices are not real, “waste” or unrestrained use may likely be an outcome:

“...If a finite resource is free, human beings tend to use it all up, regardless of the consequences...” (Litman, 2004).



Road Pricing – Saviour for Livability? (3)

Road pricing mechanisms and experience elsewhere (1)

- Numerous cities throughout the world have implemented various types of road pricing schemes with varying levels of success
- The various road pricing categories include:
 - *Congestion or peak period pricing* – for example, a “flat rate” based on distance or time or combination of both over the road network during a given time period, e.g. morning peak hour
 - *Area or Cordon Pricing* – for example, a perimeter around a central business district is enforced and if a road user “crosses” the boundary a charge is registered for entering the cordon zone
 - *Toll Roads and High Occupancy Toll (HOT) Lanes* – includes a route for which you pay a toll to use that particular route as it likely has some benefit to the road user (usually time or distance or both) whereas HOT lanes are a specialised transit lane for which the price to use the facility changes depending on the level of congestion on the adjoining general purpose lanes



Road Pricing – Saviour for Livability? (4)

Road pricing mechanisms and experience elsewhere (2)

- Examples of various schemes used throughout the world are provided below in Table 1
- None of the schemes nominated below charge the “real cost” associated with the provision of infrastructure and impact on the community, that is, the marginal social cost price.
- It would therefore be realistic to expect that the “real costs” would likely result in far more dramatic effects than those outlined below.



Road Pricing – Saviour for Livability? (5)

Road pricing mechanisms and experience elsewhere (3)

Table 1 Experience elsewhere

London – Cordon Pricing Scheme

In February 2003 London became the first city in Britain to introduce congestion charging. All vehicles have to pay a charge of £5 (about \$A13) to drive in Central London between 7:00am – 6:30pm, Monday to Friday, with certain exceptions.

- to date the scheme has been judged a success with approximately 110,000 motorists per day paying the charge
- survey figures from December 2003 show a reduction in congestion of around 30% with typical traffic delays in the charging zone showing a reduction from 2.3 minutes per kilometre to 1.7 minutes per kilometre
- the scheme has been successful in achieving its aims of reducing congestion
- revenues are used to fund improvements in public transport
- traffic has been more responsive to the charges than was originally anticipated.



Road Pricing – Saviour for Livability? (6)

Road pricing mechanisms and experience elsewhere (4)

Singapore – Electronic Road Pricing System (ERPS)

In use in Singapore since 1975 with considerable success. From 1998, this was adapted into a more sophisticated electronic charging system the ERPS.

- results indicate a 15% reduction in overall traffic levels
- ERPS was chosen because of the high level of land exploitation and high standard of living. These conditions combined to result in the need for traffic restrictions.
- the purpose of the system is to regulate traffic in order to increase accessibility.
- the basis for the charge is to achieve a target-speed that gives improved accessibility. If the average speed drops the fees increase and vice versa.
- Since 2001 the charges also have environmental measures as a purpose, and electric and hybrid vehicles pay a lower fee
- the charge varies for different places, types of vehicles and hours
- the fee is at its highest about € 1.5 (\$A2.6) per gate at peak time
- the revenue is incorporated into the national accounts (consolidated revenue) and is not distinguished from other state revenues.



Road Pricing – Saviour for Livability? (7)

Road pricing mechanisms and experience elsewhere (5)

Norway – Various cities, special area permits

Area charging has been used in Oslo, Bergen and Trondheim for at least 10 years.

- uses special area entry permits
- primarily focused on raising revenue to fund transport improvements
- reductions in the overall traffic levels have been noticed, for example, Oslo, the car traffic reduction is estimated as 5%; Bergen the effect is slightly higher at 6-7%
- reasoning for system implementation was increasing road congestion during the 1980's
- systems utilise a ring of toll stations on all roads leading towards the city center, for example, there are 19 toll stations placed around Oslo.



Road Pricing – Saviour for Livability? (8)

Road pricing mechanisms and experience elsewhere (6)

Switzerland (and others)– Commercial vehicle distance charge

In 2001 Switzerland implemented a kilometre charge for use of its road systems by goods vehicles of more than 3.5 tonnes gross weight. Other cities in Europe also considering this option e.g. Germany and the UK.

- charge varies with the commercial vehicles characteristics, such as pollution levels therefore it attempts to take account of environmental cost
- charge based on valuations of infrastructure and environmental costs
- charged by means of an on-board unit linked to the tachograph so it is therefore a transparent charge
- the kilometre charge is considered to be a success as it has resulted in a reduction in motorway traffic and has led to the renovation of the heavy goods vehicle fleet to lower and cheaper emission class vehicles
- does not currently vary by location and time of day therefore it does not reflect differing levels of congestion
- only applies to CV's and therefore does not manage the effect of the large private vehicle market
- revenue from the tolls are spent on the transport sector, particularly on infrastructure projects
- funding available from the revenue was aimed at expanding the capacity of the rail network in order to facilitate a modal shift from road freight to the railways. This effect was then expected to reduce the costs on the roads and contribute to relieving road congestion.



Road Pricing – Saviour for Livability? (9)

Road pricing mechanisms and experience elsewhere (7)

HOT lane locations

- HOT concept has generated strong debate among transportation professionals, politicians, and public advocates.
- Most discussions focus on the public's willingness to pay for premium travel conditions in congested highway corridors and the perceived equity issues involved in providing such service to those who choose to pay for it.
- Existing HOT facilities are popular with local motorists, for example, Houston's QuickRide System,
- SR 91 Express Lanes, San Diego I-15 Corridor and US Route 101 Corridor—Marin and Sonoma Counties
- Support is consistent among motorists of all income levels, including both those who use existing HOT lanes on a regular basis and those who do not.
- Experience shows that most motorists use HOT facilities on a selective basis when trip purpose justifies the expense—regardless of income.



Road Pricing – Saviour for Livability? (10)

Can road pricing help shape our Australian communities?

A real option? What is our position as a community? (1)

- road pricing has become a more accepted Travel Demand Management (TDM) tool worldwide ever since London's bold move of introducing the London Cordon Pricing Scheme
- the inability for any given urban area to keep pace with the need for additional roadspace is a common plight for most major urban areas throughout the world
- in Europe interest in road pricing has grown in recent times to the point that a large number of cities are interested in implementing a road pricing scheme (see Figure 1 below).

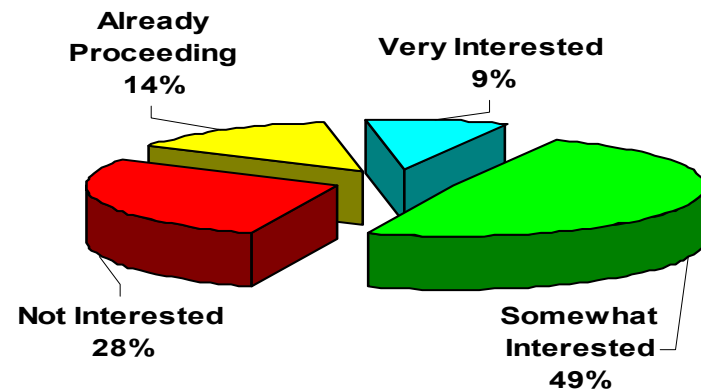


Road Pricing – Saviour for Livability? (11)

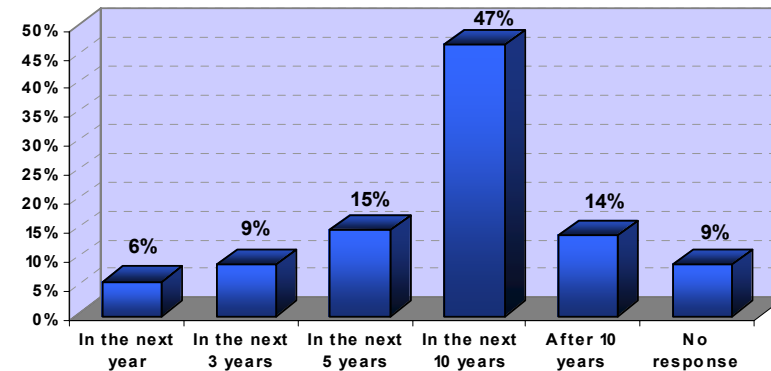
Can road pricing help shape our Australian communities?
A real option? What is our position as a community? (2)

Figure 1: Level of interest and timing for charging schemes

Level of Interest in Charging Schemes



Timing for Implementation of Charging



Road Pricing – Saviour for Livability? (12)

Can road pricing help shape our Australian communities?

A real option? What is our position as a community? (3)

- many Australian cities make reference to the possibility of the introduction of road pricing, for example, the Brisbane Transport Plan
- interest usually stems from an interest in road pricing as a travel demand management (TDM) measure
- for most locations, one of the greatest hurdles to the introduction of a road pricing scheme is the lack of strong political will and action
- require a “champion” as was the case for London; Mr Ken Livingstone (Mayor of London) provided strong leadership and commitment to the implementation of a road pricing scheme
- a champion is required to drive the task of convincing all stakeholders (including the community) of the need to recognise the value of road pricing measures in helping shape each of our communities.



Road Pricing – Saviour for Livability? (13)

Can road pricing help shape our Australian communities?

A real option? What is our position as a community? (4)

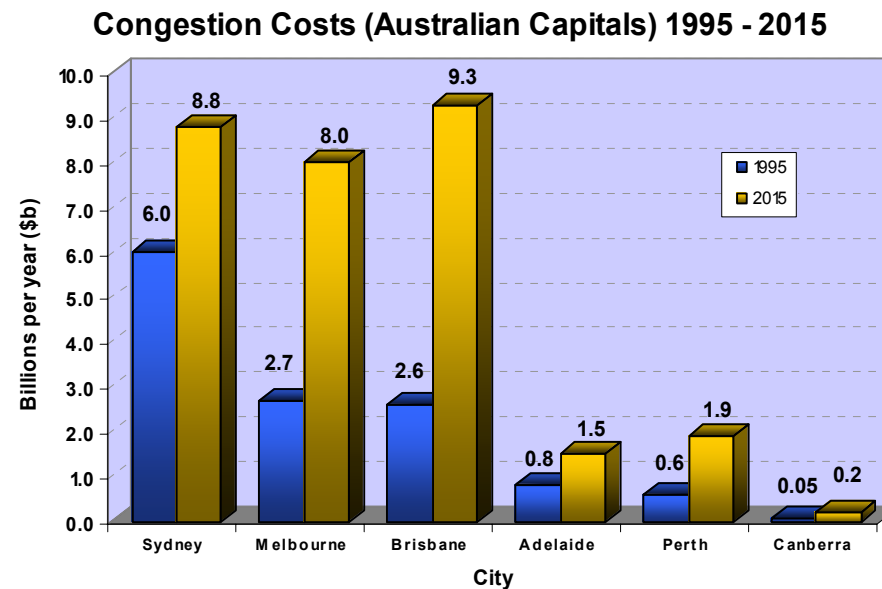
- our Australian cities need to curb the ever increasing demand for private vehicle travel
- congestion costs are rising, see Figure 2 below
- the debate needs to commence in each of our Australian communities about the real cost of private vehicle travel not only to each individual but also to our community and future generations
- a clear position now needs to be taken that considers all of the future costs of “doing nothing” to curb private vehicle travel demand.



Road Pricing – Saviour for Livability? (14)

Can road pricing help shape our Australian communities?
A real option? What is our position as a community? (5)

Figure 2 Congestion costs in Australia (1995 – 2015), costs per annum
Note: Total 1995 = \$12.8b, Total 2015 = \$29.7b



Road Pricing – Saviour for Livability? (15)

Can road pricing help shape our Australian communities?

Toll roads and their role (1)

- the implementation of toll roads in many Australian cities could be seen in some ways as being a move towards a road pricing framework
- however, toll roads are a very blunt instrument
- Figure 3 below illustrates where toll roads (otherwise thought of as corridor schemes) sit on the continuum of road pricing schemes
- could toll roads actually be part of the problem if they do not result in a reduction in private vehicle demand?
- existing toll road networks need not be an impediment to the introduction of a road pricing scheme
- if toll roads exist in a given location it would require restructuring of the existing revenue approach, say “distance” or “distance and time” across a whole network rather than “point to point”.

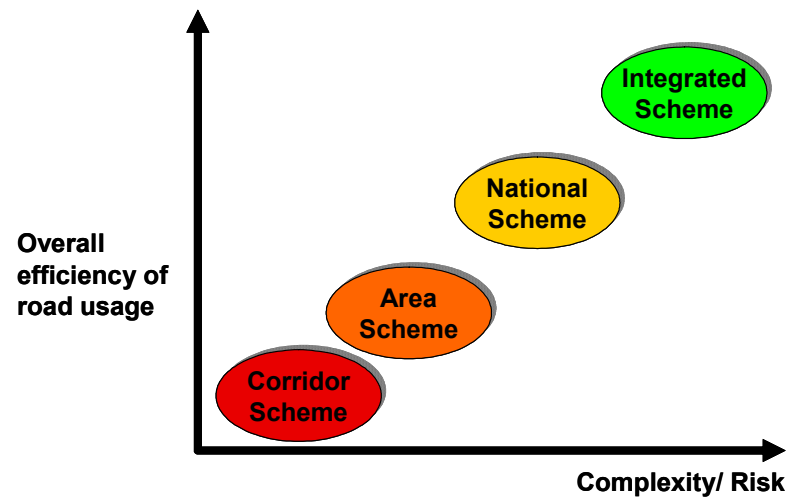


Road Pricing – Saviour for Livability? (16)

Can road pricing help shape our Australian communities?

Toll roads and their role (2)

Figure 3 Continuum of road pricing schemes



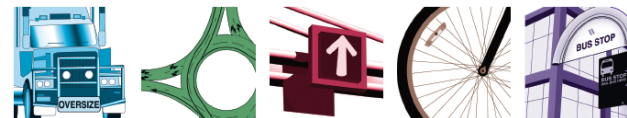
Road Pricing – Saviour for Livability? (17)

Can road pricing help shape our Australian communities?

A tool to help shape our communities (1)

- road pricing is one mechanism to assist in achieving a sustainable transport system
- a road pricing strategy requires a holistic approach
- it requires political will, community engagement and understanding
- existing schemes do not impose the “real cost” but still achieve large reductions in traffic, e.g. 15% in London

“...mayor, Ken Livingstone, strides into the room before a bank of cameras, and with an unusually pleased look, announces a coup, one that has eluded dozens of large cities like New York, Los Angeles and Paris. He has not conquered crime or poverty, but he may very well have hobbled an urban enemy seemingly just as invincible: the car...”



Road Pricing – Saviour for Livability? (18)

Can road pricing help shape our Australian communities?

A tool to help shape our communities (2)

- any policy that reduces car dependence will clearly have immediate ‘livability’ benefits for the community previously affected (reduced air and noise pollution, “streets for the people” etc.). These benefits are both immediate and to the longer term benefit of the community
- at some point we have to consider as a community “how many roads are we as a community prepared to have constructed”?
- resultant reductions in traffic growth due to a road pricing scheme are taken up by alternative modes such as public transport, pedestrian and cyclist movements or other (e.g. trip chaining, telecommuting or not doing “unnecessary trips” at all).



Road Pricing – Saviour for Livability? (19)

Can road pricing help shape our Australian communities?

A tool to help shape our communities (3)

- other likely responses are land use changes and other technologies evolving to respond to the changing travel demand framework. Investment would then be available for other modes, policies and technology
- is the correct price the one that results in the community being “shaped” in the best way, that is, in accordance with each cities “vision” for itself; or the one that ultimately reduces trip lengths and changes travel behaviour to then lead to the priming of the development market to take advantage of these changes?
- should a city define its primary road network and then implement a pricing scheme to assist in reducing the need for increasing road capacity?



Road Pricing – Saviour for Livability? (20)

What do we need to do to make it happen?

Highlight the benefits (1)

- the benefits need to be highlighted to the community
- a road pricing scheme requires a strong marketing and consultation campaign
- benefits of implementation of road pricing schemes are numerous, including increased public transport usage; increased cycling and walking; land use changes including increased densities, TOD's; more sustainable and livable communities amongst many others
- the greatest benefit of these schemes are usually:

“...The big environmental gain is that new roads can be avoided...”
(Eliasson et al, 2003)



Road Pricing – Saviour for Livability? (21)

What do we need to do to make it happen?

Technology (1)

- technology holds the key to the successful implementation of most forms of road pricing, be it a toll road, HOT lanes or a full distance/time based road pricing scheme for an urban area
- the emergence of effective technology is one of the reasons why road pricing schemes are becoming a reality more so now than in the not too distant past
- suitable technology is pivotal in the delivery of these schemes
“...experience shows that key factors in the successful introduction of large road pricing schemes are reliability, acceptance and efficiency...”
(Tip et al, 2004), as they relate to technology.
- various technologies have been used throughout the world to implement road pricing schemes, each at varying levels of complexity suitable to the application
- need to consider the social dimension, e.g. privacy and equity considerations.



Road Pricing – Saviour for Livability? (22)

What do we need to do to make it happen?

Technology (2)

- a suitable framework could consist of the following technological components:
 - *In vehicle* – GPS (satellite) or other system to track the vehicles location;
 - *Collection agency* – A central computer system that tracks and records data for each vehicle based on the inputs from the GPS (satellite) or other network
- technology is now able to help deliver road pricing schemes and therefore reduce congestion more cost effectively compared to say the provision of new road infrastructure
- in the UK the recent release of the feasibility study into road user charging “...suggests that a national scheme for all vehicles based on satellite tracking technology could, with the appropriate pricing structure, cut congestion levels by an incredible 50 percent...Such a scheme could be implemented as early as 2015...” (Meczes, 2004). This outcome certainly highlights the potential of “real cost” pricing schemes.



Road Pricing – Saviour for Livability? (23)

What do we need to do to make it happen?

The changes we each have to make (1)

- changes have to be made at the individual, community and political levels to successfully implement road pricing schemes
- the key arguments that drive change at each level are as defined below:
- Individual

“...Respondents believed that distance-based charging would make motorists think about how they used their car more. It was thought that it might prompt people to use cheaper forms of transport. The direct relationship between a motorist’s mileage and the charge would make the cost of driving much more explicit. It was also felt that distance-based charging would make people think twice about whether a journey was really necessary, for example taking the car to the shops when they could walk...”(DfT, 2004).



Road Pricing – Saviour for Livability? (24)

What do we need to do to make it happen?

The changes we each have to make (2)

Community

“...Support for road pricing depends on how the question is phrased...How many that claim to support a road pricing system fully depends on how the question is phrased. The lowest support is returned when asking about road pricing as an isolated measure, not mentioning what the revenue is meant for, how the charges will be constructed, etc. The support usually increases if it is declared that the revenue is supplemented by other measures (e.g., improvement in roads and public transport) and that the revenue is needed (i.e. the other measures are not sufficient), specifying where the money goes and make it plausible that the charges have effect...”(Eliasson et al, 2003).

Political

“...Providing local, direct and visible benefits to road users and the community may become the principal drivers for successful urban congestion charging...” (Pickford, 2004).



Road Pricing – Saviour for Livability? (25)

Conclusions

- *the livability benefits derived from the implementation of a road pricing scheme in an urban area are clear*
- *all cities that have implemented schemes have derived demonstrable benefits*
- *the UK is now considering the implementation of a road user charging scheme across the entire road network. It is anticipated that this will reduce congestion by 50%*
- *proper consideration of the introduction of these schemes in Australia is required*
- *an initial step may include investigations into the potential benefits and hurdles to implementation and actions to address these*
- *any scheme would need to fit within the “vision” for each of our communities*
- *a true user-pays system does have a place in our community*
- *what is needed now are more detailed investigations; a “champion” to drive this process forward and an opening up of the debate within our communities about our travel choices and their impacts now and in the future.*

