Managing transportation demand in Singapore

This item was submitted to Loughborough University's Institutional Repository by the/an author.

**Citation:** ENOCH, M.P., 2004. Managing transportation demand in Singapore. Traffic engineering and control, 45 (3), pp. 100-102

**Additional Information:**

- This is a journal article. It was published in the journal, Traffic and control engineering [© Hemming Group Ltd] and is also available from: http://www.tecmagazine.com/

**Metadata Record:** [https://dspace.lboro.ac.uk/2134/3411](https://dspace.lboro.ac.uk/2134/3411)

**Publisher:** © Hemming Group Ltd

Please cite the published version.
This item was submitted to Loughborough’s Institutional Repository by the author and is made available under the following Creative Commons Licence conditions.

For the full text of this licence, please go to:
http://creativecommons.org/licenses/by-nc-nd/2.5/
Managing transportation demand in Singapore

Singapore has long held a well deserved reputation for being at the cutting edge in the field of managing the demand for car use. But in addition to the high profile policies of charging for road use and rationing the number vehicle licences through a vehicle quota system, the South East Asian city state has also been innovative with a number of supporting policies too. In this article Marcus Enoch takes a more rounded look at the Singapore experience.

CHARGING FOR ROAD USE

Of course there is no escaping from the impact of charging for road use. Area-wide road user charging was first successfully tried in Singapore in 1975 and was introduced because during the 1970s there was very nearly full employment and the city was growing very rapidly as a manufacturing and financial hub. Incomes were rising and people could see that traffic congestion was getting worse. The problem was that there was an absence of measures to restrain car use.

As a result, the Ministry of Communication decided to introduce an Area Licensing Scheme (ALS), which was a complete cordon around a Restricted Zone (RZ) – effectively the Central Business District area. Initially, motorists entering through one of the 33 entry points had to buy the coupons at booths by the side of the road or at petrol stations. The scheme was manually enforced, motorists had to display a coupon in the windscreens which were checked on entry to the restricted zone (RZ) – which was effectively the CBD area. The scheme operated between 7am and 7pm. Payment was a fixed cost of $S3 a day.

The ALS worked but there were disadvantages. It was labour intensive and therefore quite expensive to run. It was difficult to alter the charges – as huge print runs were required to print new coupons – and this lack of flexibility meant it was not possible to price according to congestion levels.

In 1998 therefore, the ALS system was automated and in 1999 it was replaced with an electronic road pricing system to reduce labour costs and to allow for pricing to be used to reduce congestion. Drivers must charge up a smart card to insert into a meter on the dashboard. This smart card is then debited every time the vehicle passes under a gantry. If the card does not contain enough credit or is not inserted into the meter, then cameras record the registration plate details and a fine is automatically sent to the motorist’s address.

This is based on 28 entry points of the RZ. In addition, more gantries have since been established at certain points on the Outer Ring Road (ORR). This is not a closed cordon and there is some diversion of traffic. About ten gantries are positioned at eight locations – four or five are on the expressway. There are 17 locations altogether on the ORR.

RESTRICTING VEHICLE OWNERSHIP

But, despite the success of restricting city centre traffic through the ALS, in 1990 the Singaporean Government still felt that the 6% a year growth of the car...
population was far too fast for the road network to accommodate. Accordingly it decided to regulate growth to 3% a year, and introduced a Vehicle Quota System (VQS) to achieve this.

Initially, this system worked by taking into account the de-registered vehicles and then allowing 3% more licences. Certificates of Entitlement (COE) were then offered in eight categories. Categories one to four were based on size of car, then there were motorcycles, goods vehicles, buses and one open category. This was reduced from 1999, and there are now only two car categories, following a review of the system.

Each COE is valid for ten years, and on expiry, the vehicle owner must renew the COE paying the prevailing quota rate. COEs are awarded through a competitive bidding process. This was a closed process until 2001, but is now open. Tenders can now be submitted online.

The current average cost of a COE is about $S30,000, while the highest was around $S100,000, with the rate decided by the number of prospective customers. The number of COEs to be made available is announced at the start of each financial year. The ‘number of vehicles on the road’ calculation has been made.

As well as paying for a COE, vehicle owners in Singapore also face other vehicle taxes. These include an import fee worth 130% of the open market value of the vehicle, an excise tax of 20% and a registration fee of $S140, although there is no purchase tax. Ongoing costs are that petrol taxes are 35% of the pump price and there is an annual road tax bill of around $S1,200. Overall, for a 1.6L engined car with year once the ‘number of vehicles on the road’ calculation has been made.

Interestingly, it is the developers that are seen to be pushing for even lower parking standards rather than the public authority. Indeed, while there is a desire to deregulate parking standards among the transport authorities (whereby developers would develop parking as appropriate), the URA has so far resisted this because it fears that developers would be tempted to use all of its gfa for revenue generating activities, whereas currently land for parking spaces must be supplied in addition to the gfa for revenue generating activities, and developers would be tempted to use all of its gfa for revenue generating activities.

In short, if parking regulations were to be relaxed, this would mean that developers would be able to provide more parking spaces, which would be very difficult to control. In practice though, this already
The levy on private non-residential parking spaces has almost certainly led to businesses encouraging their staff not to drive to work wherever possible.

The levy on private non-residential parking spaces has almost certainly led to businesses encouraging their staff not to drive to work wherever possible.

The levy on private non-residential parking spaces has almost certainly led to businesses encouraging their staff not to drive to work wherever possible.

CONCLUSIONS

At this point it should be noted that there are several areas where Singapore is not as progressive as some other cities. For example, where pedestrians must cross the road at traffic signals they invariably must wait for a long time. This is partly because there is a feeling that motorists are not to be inconvenienced - they have paid for the road space after all and deserve a high quality of service as a result. Nevertheless, the objective to reduce road traffic in the city centre has been met and maintained for a quarter of a century. No other traffic management system in the world has achieved anything like this performance over such a period.

Yet despite this success, no other city has attempted to follow the same path. This has often been attributed to several quirky features of the Singaporean situation, that have been seen not only to hinder but to totally prevent any meaningful policy lessons being transferred elsewhere. In many respects such recalcitrance is valid as there have been a number of very specific and even unique circumstances that have played a major part in the success of the Singapore story. For instance, the political and economic situation has meant that citizens of Singapore are largely law-abiding, and very respectful of authority, trusting the Government to make decisions in the national interest. Singapore is also a very densely populated island, and there are no nearby cities to attract businesses to relocate, while internally the national land use plan prevents developers from playing off competing planning authorities against one another. Finally, road pricing is seen to be that strong regional land use plans over a very long period (albeit in a rapidly growing economy) can allow public transport rather than the car to shape land use patterns, resulting in economically viable and attractive public transport system and a far more efficient road network. This would seem to strengthen the case for long-term regional land use plans where development is focused in a way that favours public transport over the car.

Closely related to this is the fact that significant improvements to the public transport system have been carried out at the same time as the restrictions on road traffic have been introduced. For many people therefore, owning a car is not the necessity it might be elsewhere, ie public transport really is a viable alternative for the majority of journeys.

Lastly, the role of parking policies, particularly the levy on non-residential spaces, has almost certainly led to businesses encouraging their staff not to drive to work wherever possible, with the evidence for this being that developers are far keener to provide more revenue generating gross floor area than car parking spaces.

In summary, the Singaporean parking and development policies have been little known but key elements in the traffic management strategy over a number of years, although with the adoption of the ERP and COE schemes its relative importance as seen by policy makers has diminished somewhat. However, in cities where road pricing and vehicle rationing are less likely to be adopted (ie the vast majority), such innovative policies could well offer a less high profile and thus less more politically acceptable approach towards limiting traffic.

ABOUT THE AUTHOR

Marcus Enoch is a lecturer in Transport Studies in the Civil and Building Engineering Department at Loughborough University, and a freelance transport journalist. He can be contacted by email at m.p.enoch@lboro.ac.uk.

ACKNOWLEDGMENTS

My thanks are due to Chan Sin Hui, Kenneth Wong and Lim Liang Chuan of the Land Transport Authority, Singapore.