

TRANSPORT PRICING POLICY IN HONG KONG

Mahmud Hassan TALUKDAR

University of Hong Kong, Hong Kong

mahmud_urp@yahoo.com

Abstract

Over the last decades, many cities have experienced a rapid increase in automobile as a result of continuous population growth and pursuing better quality of living. Vehicle growth and limited space of cities bring a problem of traffic congestion. In coping with this problem, various traffic management measures are being applied worldwide. Transport pricing policies are demand management measures of transportation system to reduce traffic congestion. Like many other cities, Hong Kong is also applying various transport pricing policies for relieving congestion resulted from a steady vehicle growth. Present paper aims to explain different forms and the impacts of transport pricing techniques in Hong Kong. So, the main aim of this paper is to explore the impacts of transport pricing techniques in Hong Kong. Literature review and case study are the main source of information of this study. In this paper, after introductory section, some international experiences of transport pricing policy are described and after that various transport pricing policies in Hong Kong presented. After describing various transport pricing policies in Hong Kong their impacts are asserted. This paper ends with a concluding remarks of Electronic Road Pricing (ERP) can be an effective solution for long term success but the government need to do adequate campaigns to gain the public support in favor of ERP.

Keywords: transport pricing, policies, Hong Kong

1. INTRODUCTION

The transport situation of Hong Kong is very unique and is more challenging due to its geographical constraints. It is located at the mouth of Pearl River Delta (PRD) and has a total area of 1,103 km², occupied by 7.1 million populations with an annual growth rate of 0.6%. The population density is over 6.5 thousand persons per km² and population mainly concentrates in the main urban areas. (Census and Statistical Department, CSD, 2012). Such a large population and concentrated development generate much traffic demand within the city. However, continuous population growth leads incessant growth of traffic demand and under this continuous growing traffic demand in the limited space, the future transport situation faced by Hong Kong will be more severe. So, to maintain at reasonable limit of congestion and to increase the efficient use of the road space, appropriate forms of road pricing techniques in Transport Pricing Policy need to apply in Hong Kong.

2. INTERNATIONAL EXPERIENCE OF TRANSPORT PRICING POLICY:

2.1. London, United Kingdom

Since February 2003, the city of London has charged £5 daily for private automobiles for entering the central London during weekdays as a way to reduce traffic congestion and raise revenues to fund transport improvements. It has effectively reduced traffic by 16% during the operation hours (Transport for London, TfL, 2003, quoted in Hon, 2005, p.39). Due to the significantly reduction of traffic congestion as well as improvement of bus and taxi services along with generating substantial revenues, public acceptance has grown and there is now support to expand the program to other parts of London and other cities in the UK.

2.2. Singapore

Singapore has done outstanding transport pricing policies for reducing congestion. In 1975, an area licensing scheme (ALS) based on road pricing concept was introduced. Under this scheme, vehicles entering the restricted zone bounded by 28 cordons in the central area during the operation hours had to display a pre-purchased license on their windshields and the license charge was S\$3 per day (Richards, 1990; Hau, 2001, quoted in Hon, 2005, p. 42). In 1998, Singapore transformed its ALS into the electronic version, known as electronic road pricing (ERPS). Under the ERPS, drivers are charged with using smart cards and its technologies provide an easy adjustment on the charging. Compared with London's one, Singapore ERPS is relatively small and it is more rigorous because charges are paid for each entry, but not for the whole day unlimited access (Blow et al., 2003). The ERPS had effectively reduced daily traffic volume in the central area by 10-15% (Chin, 2002, quoted in Hon, 2005, p. 43).

2.3. Rome

The Limited Traffic Zone (LTZ) has been implemented in Rome since October 2001 which uses an automated access control system including a flat fare RP (Road Pricing) Scheme, in order to limit private vehicle access to the historic city centre. According to Wolfram (2005, p.43), main characteristics of the LTZ are: electronic gates, which permit fee-paying access and parking in the LTZ to the users; access to the LTZ for authorized people is based on an annual permit which is worth the equivalent of a 12 month public transport card that is 311.47 Euro, while some other specific authorized people pay half fare; the number of access permissions is about 20,000 and covers the parking cost inside the LTZ during the enforcement (6:30-18). Externally to this time parking rate per hour is applied also to these

users up to 23.00. The LTZ scheme has proven very successful as effective demand management policy. It reduced 20% car traffic in restriction times (6:30-18) (Wolfram, 2005, p.44).

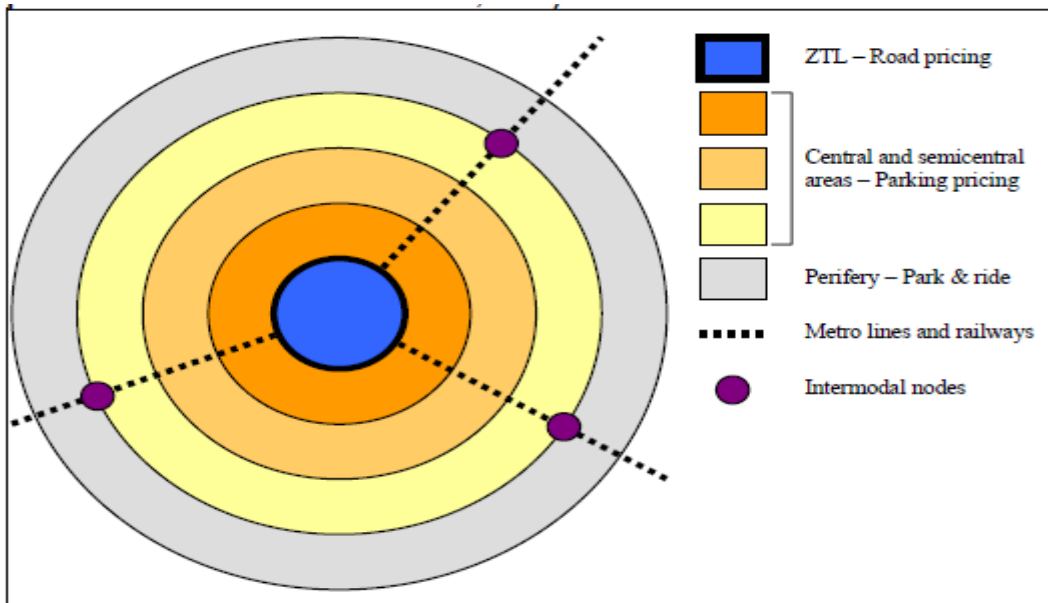


FIGURE 2 - PRICING POLICIES IN THE CITY OF ROME
Source: Wolfram (2005, p.44)

2.4. Other Cities

In Norway, cordon tolls have been introduced around the centers of three cities (Oslo, Bergen, and Trondheim), but the motive appears to be to raise money to finance urban road construction, rather than to achieve optimal level of congestion (Thomson, 1998, p. 96). In many other cities around the world, proposals have been tabled for road-pricing schemes, in various degrees of detail. In 1978, Bertrand produced a model for estimating congestion costs caused by different classes of vehicle and optimal congestion taxes, adopting Zahavi's theory of the travel budget; and he applied the model to Bangkok. In addition to Bangkok, proposals have been made in Manila, Jakarta, Sao Paulo, and other such cities, but they have never come close to implementation (Thomson, 1998, p.96).

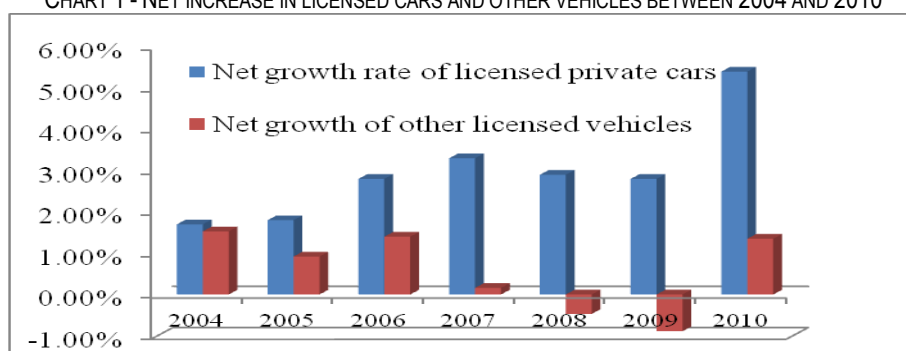
3. TRANSPORT PRICING POLICY IN HONG KONG:

Two types of transport demand management techniques are used in Hong Kong as the road pricing policy; vehicle ownership controls and vehicle use controls. The government also had a trial of another economic measure for coping with the congestion, electronic road pricing system (ERPS).

3.1. Vehicle ownership control

Like other busiest cities, the main problem of Hong Kong is the rapid growth of private cars than other public transport vehicles. For instance, it is observed that from 2004 to 2010 the highest percentage increase was found in private car, with a growth of 5.4% at the end of 2010 (Chart-1). But, private cars consists of only 15% passenger journey of road based transport while the remainder road based public transport, such as franchised buses, mini-buses consists of 85% (LC Paper No. CB (1)2172/10-11(01), 2011, p.2).

CHART 1 - NET INCREASE IN LICENSED CARS AND OTHER VEHICLES BETWEEN 2004 AND 2010



Source: Prepared by author taking data from Legco Paper No. CB (1)2172/10-11(01)

TABLE 1 - LIST OF FIRST REGISTRATION TAX IN HONG KONG, 2011

Class of Motor Vehicle	Rate of Tax
1. Private cars	
a. The first \$150,000 of taxable value	40%
b. Next \$150,000	75%
c. Next \$200,000	100%
d. Remainder	115%
2. Motor cycles and motor tricycles	35%
a. Goods vehicles, other than van-type light goods vehicles (LGV)	15%
b. Van-type LGV not exceeding 1.9 tonnes permitted gross vehicle weight:	
i. On the first \$150,000	35%
ii. On the next \$150,000	65%
iii. Remainder	85%
c. Van-type LGV exceeding 1.9 tonnes permitted gross vehicle weight	17%
3. Taxis, Light buses, Buses and Special purpose vehicles	3.7%

Source: Transport Department, 2011

So, Hong Kong government has been using fiscal measures through taxation to control private cars growth. Vehicle ownership taxations of First Registration Tax (FRT) and Annual License Fee (ALF) have been applied. FRT is a purchase tax which is paid upon vehicle purchase based on the value of the vehicle. The ALF is paid annually based on engine size of the vehicle. FRT and ALF of private cars are significantly higher than most other vehicles.

3.2. Vehicle use controls

For vehicle use control Fuel tax, tunnel tolls and parking controls have been applied in Hong Kong. Fuel tax is a simple traffic control administration measures where individuals have the personal choice to decide when, where and how much to use their cars. Tolls are charged in most road tunnels in Hong Kong with an aim to eliminate of queues of traffic waiting for the over-capacity tunnel which blocks the adjacent road network. For parking controls Hong Kong has both on street and off street parking policies. For public on street parking current policy adopted in Hong Kong is to discourage long-term parking, charges and timings for parking meters are used with the aim for a 15% availability rate (CTS2, 1989.p.176). In case of off street parking, government car parks were privatized in 1984 and the operating company has the freedom to set parking tariffs accordingly but the government intervention on the tariff charges is allowed to reach the target aimed of 15% availability rate (CTS2.1989.p.176)

3.3. Electronic road pricing system (ERPS)

Between 1983 and 1985, the government also had a trial of another economic measure for coping with the congestion, electronic road pricing system (ERPS). This is the first pilot study of ERP around the world. According to Clency et al. (1985), under this scheme, 2500 selected vehicles were fitted with electronic number plates (ENP) for the test. With the technology of AVI, this ENP permitted the computer system to identify vehicles, to trace vehicle movements and to record the actual amount of road use. Based on this mechanism, car owners could be charged for road use when entering into the restricted zones. This experiment was finally proved to be technically feasible and practicable at 99.7% reliability (Hau, 2001, p.144). However, owing to public opposition and their worries about privacy, it was not carried out (Hon, 2005, p. 75).

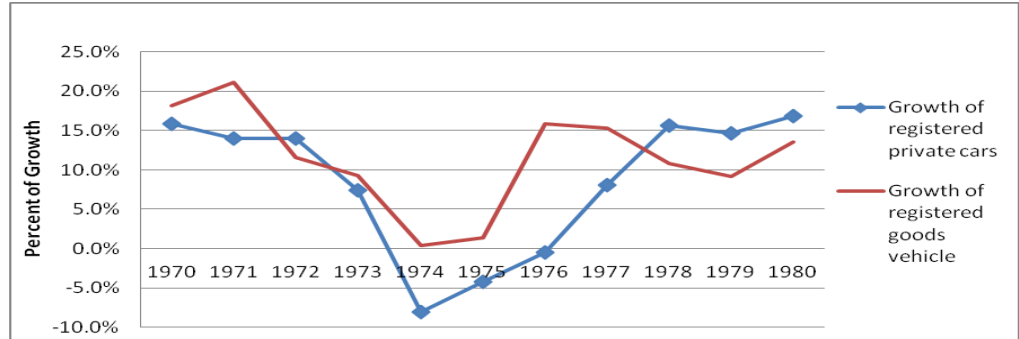
4. IMPACTS OF DIFFERENT FORMS OF PRICING IN HONG KONG

4.1. Impact of Vehicle ownership control

Vehicle ownership taxation is effective to regulate the size of vehicle fleet particularly the private cars. For instance, the growth of registered private cars was 15.8%, 14%, 14% and 7.4% from 1970 to 1974 respectively but the growth of private cars decline in the year 1974 and it was -8.0%, -4.2% and 0.5% from 1974 to 1976 respectively (Chart-2). The size of the private car did not decline automatically rather it was the outcome of government's initiative. To tackle the growth of private cars, Hong Kong government had increased FRT by 50% for private cars and motor vehicles and the annual license fee

were approximately trebled and the combination lead to a decline in the number of private cars for three years, it did not exceed the previous peak until five years later (Hau, 1999, p.3-4).

CHART 2 - GROWTH OF REGISTERED PRIVATE CARS AND GOOD VEHICLES FROM 1970 TO 1980

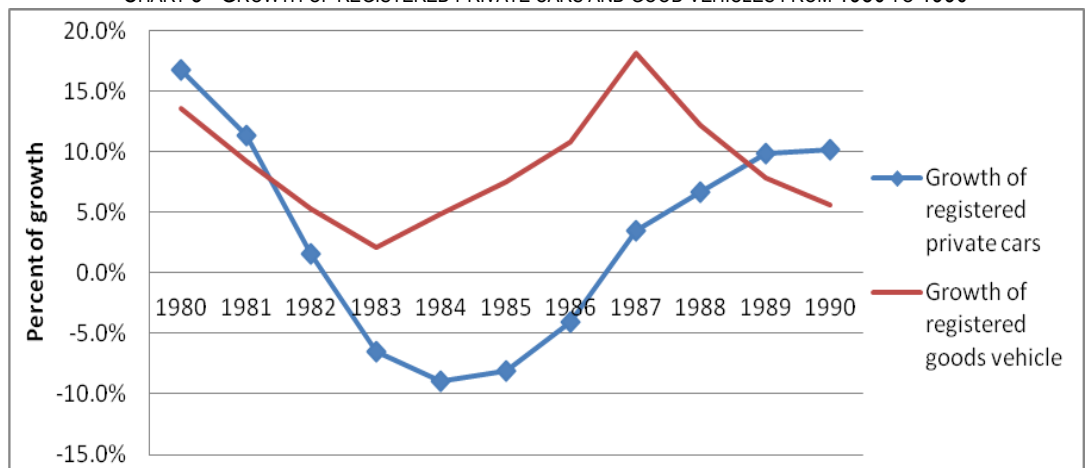


Source: Prepared by the author taking data from Hau (1999)

Second example of the impact of vehicle ownership control is the second fiscal restraint measure which was the heavy increase in FRT and ALF in may 1982. This measure has successfully reduced number of private cars for five years (Transport Branch, 1990, p.39; Hau, 1999, p.4). The argument will be clearer from Chart 3. In 1980 and 1982 the growth of private registered car in Hong Kong was 16.8% and 1.6% respectively. After the heavy FRT and ALF being imposed the growth rate declined and was 1.6%, -6.5%, -8.9%, -8.1%, -4.1% and 3.5% from 1982 to 1987 respectively.

Vehicle ownership control measures have some negative impact also. FRT has no control effect on the pre-existing vehicle owners. ALF increase all the vehicles operation cost. However, Car ownership taxation is non selective and affects all traffic on roads in congested and non-congested areas.

CHART 3 - GROWTH OF REGISTERED PRIVATE CARS AND GOOD VEHICLES FROM 1980 TO 1990



Source: Prepared by the author taking data from Hau (1999)

4.2. Impact of Vehicle use controls

There are some positive impacts of vehicle use controls approaches. The increase of fuel tax may reduce the number of unnecessary trips and it can also help to reduce pollution. Imposing tunnel tolls can reduce traffic volume in the tunnel area. For instance, Tunnel tolls was imposed in 1984 on the cross Harbor tunnel which reduce car and taxi goods traffic by about 15% and light goods vehicles traffic by about 13% (CTS2, 1989, p.175). Parking control can also limit the number of trips made by private cars in busy districts. When there is insufficient provision of parking facilities in busy districts, people usually tend to avoid the trip.

On the contrary, there are some negative impacts of vehicle use control approaches. For instance, fuel tax applies all traffic regardless it is congested or non congested areas, peak and non peak hours. Drivers living in the New Territories who have to travel long distance would have to bear a heavy burden compared to shorter distances in the congested urban area, although most roads in the New Territories are not congested. Insufficient provision of parking facilities may increase road congestion as drivers will circulate on the road to find parking space and also will increase the chances of illegal parking.

4.3. Possible impact of Electronic road pricing system (ERPS)

The ERPS is an effective instrument in reducing congestion pressure. According to the estimate of ERP study report of 1998, it could divert 40% of car trips to public transport, thereby increasing travel speed to at least 20km/h if ERPS was applied. In the Feasibility Study on Electronic Road Pricing by Transport Department (2012, p.25) of Hong Kong some transport operate benefits and also some economic and environmental benefits of ERP are identified. The transport operation benefits relate to reduced vehicular traffic, particularly during congested periods, reduced travel times, increase public transport use and higher car and taxi occupancy. The estimated net economic benefit resulting from journey time savings and lower vehicle operating cost is about \$2 billion/year. ERP is forecast to generate annual gross revenue of \$0.4 to 1.3 billion. If it is decided to adopt a revenue neutral scheme, this revenue can be ploughed back for transport infrastructure investment. The environmental benefits involve reduced vehicle emissions and reduced exposure to traffic noise inside the charging zone. While the ERP may bring about some improvement in the air quality in the charging zone, the environmental condition of other areas show some deterioration due to the overall redistribution of traffic in reaction to the ERP charging zone (Transport Department, TD, 2012, p.23).

5. CONCLUSIONS

Hong Kong is facing continuous traffic growth due to its limited space and rapid urban development. The future transport situation will be harsher with many challenges. After the opening of Western Corridor and Hong Kong-Zhuhai-Macau Bridge, cross-border traffic will increase traffic loads to the road network of Hong Kong and under the integration with the Pearl River Delta (PRD), cross-border traffic circulation will be more frequent and it will make Hong Kong's roads to be more congested. Hong Kong has limited option to further expand its road networks with a means of reclamation. Under the Harbor Protection Ordinance in 1998, the reclamation will be only permitted if the rebuttal test can prove there is an 'overriding public needs'. It is restrictive to future road expansion for relieving congestion along the waterfront of Victoria Harbor (Hon, 2005, p. 78). So, Hong Kong government has to fully depend on demand side management. Car ownership tax increase should be applied selectively to manipulate the rapid growth of private cars. Electronic Road Pricing (ERP) can be an effective solution for long term success. The governments need to do adequate campaigns to gain the public support in favor of ERP. Similar to Rome or Singapore, LTZ or ALS can be implemented using an automated access control system in order to limit the private vehicles access into the congested areas.

REFERENCES

- Blow, L., Leicester, A. and Smith, Z. (2003), "London's Congestion Charge", *The Institute for Fiscal Studies Briefing Note*, No. 31, pp. 1-18.
- Census and Statistical Department, CSD (2012), *Hong Kong 2011 Population Census-Summary Results*, Accessed from: http://www.statistics.gov.hk/publication/stat_report/population/B11200552011XXXXB0100.pdf, retrieved on 23 April, 2012.
- Clancy, M.J., Dawson, J.A.L., Catling, I., Turner, J.D. and Harrison, W.J. (1985), "Electronic Road Pricing in Hong Kong". In: Planning and Transport Research and Computation (International) Co. (PTRC), *Transportation Planning Methods: Proceedings of Seminar held at the PTRC Summer Annual Meeting, University of Sussex, England, from 15 -18" July 1985*, London: PTRC Education and Research Services.
- CTS2 (1989), *Hong Kong Second Comprehensive Transport Study Final Report*, Government Secretariat, Hong Kong.
- Hau, T. D. (1999), "Demand Management and Road Pricing", in CUPEM, CITHK, and Transport Department (ed.) *Modern Transport for the 21st Century: Conference and Public Forum*, Hong Kong.
- Hau, T.D. (2001), "Demand-Side Measures and Road Pricing". In: Anthony, GO.Y., Peter, R. H. and Simon, K.W.N. (eds.), *Modern Transport in Hong Kong for the 21st Century*, Hong Kong: Centre of Urban Planning and Environmental Management, University of Hong Kong.

- Hon, M. L. (2005), *Evaluation of traffic congestion relieving options with using cost-benefit analysis: case study of Central-Wan Chai*, unpublished MSc. Thesis, The University of Hong Kong.
- LC Paper No. CB (1)2172/10-11(01) (2011), Paper for Bills Committee on the Motor Vehicles (First Registration Tax) (Amendment) Bill 2011, website from: <http://www.legco.gov.hk/yr10-11/english/bc/bc06/papers/bc060524cb1-2172-1-e.pdf>, retrieved on 21 November 2011.
- Thomson, J. M. (1998), "Reflections on the Economics of Traffic Congestion", *Journal of Transport Economics and Policy*, Vol. 32, No. 1, pp. 93-112.
- Transport Branch (1990), *Moving into the 21st Century the White Paper on Transport Policy in Hong Kong*, Transport Branch, Government Secretariat, Hong Kong.
- Transport Department, TD (2012), *Feasibility Study on Electronic Road Pricing*, website from: http://www.td.gov.hk/filemanager/en/publication/erp_e.pdf, retrieved on 23 April, 2012.
- Transport Department, TD (2011), *First Registration Tax in Hong Kong*, website from: http://www.td.gov.hk/en/public_services/licences_and_permits/vehicle_first_registration/guidelines_for_importation_and_registration_of_mot/index.html, retrieved on 23 December, 2012.
- Wolfram, M. (2005), *Sustainable Urban Transport Plans (SUTP) and urban environment: Policies, effects and simulations*, Cologne, Germany, website from: <http://ec.europa.eu/environment/urban/pdf/sutp.pdf>, retrieved on 23 April, 2012.