

LEGISLATIVE COUNCIL PANEL ON TRANSPORT

Enhancing the Distribution of Traffic at the Three Road Harbour Crossings

Introduction

This paper sets out the options for improving the distribution of traffic between the three road harbour crossings.

Background

2. At present, there are three road harbour crossings. They are the Cross-Harbour Tunnel (CHT), the Eastern Harbour Crossing (EHC) and the Western Harbour Crossing (WHC). EHC and WHC are “Build-Operate-Transfer (BOT)” tunnels that are owned and managed by franchisees over a franchise period¹ and are governed by their respective ordinances². CHT used to be a BOT tunnel, but the franchise expired in 1999 and its ownership has since been returned to the Government.

3. Due to the differences in their locations and toll levels, the distribution of traffic among the three road harbour crossings has not been even. Their average daily traffic in 2004 by different vehicle types is at the **Annex**³.

4. We have been exploring together with WHC measures that could help enhance the utilization of WHC. These include constructing new road links leading to WHC, smoothing traffic flow at nearby road junctions, providing road markings and additional directional signs to guide motorists, etc. We will continue to explore with WHC to see if there are further measures in this regard.

¹ The franchises for EHC and WHC will expire in 2016 and 2023 respectively.

² The EHC is governed by the EHC Ordinance (Cap 215) and the WHC is governed by the WHC Ordinance (Cap 436).

³ We estimate that the impending toll increase at EHC would lead to a reduction of traffic throughput at EHC by about 17% (12,500 vehicles/day). Traffic throughput at WHC will increase by about 21% (8,400 vehicles/day) and that at CHT by about 3% (3,800 vehicles/day).

Possible Measures

5. Alongside the measures mentioned above, there are suggestions from different quarters on possible measures to achieve a more balanced traffic distribution among the three road harbour crossings. We note that due to the different geographical locations of the three road harbour crossings, and that a motorist's choice could be affected by many factors, the likely effect of all these suggested measures are no more than pure "guesstimates". Broadly speaking, these measures can be categorized into three groups. They are: –

Group 1 – Toll-Related Measures

- Option 1A: Overall Increase in CHT Tolls
- Option 1B: Peak Hour Surcharge at CHT
- Option 1C: Surcharge and Rebate at CHT
- Option 1D: Variable Toll Adjustment System at CHT
- Option 1E: Toll Increase at CHT & Toll Reduction at WHC/EHC

Group 2 – Franchise-Related Measures

- Option 2A: Buying out the Franchises of WHC/EHC
- Option 2B: Selling CHT to the Franchisees of WHC/EHC
- Option 2C: Common Ownership for CHT, WHC and EHC
- Option 2D: Extension of Franchises of WHC and EHC

Group 3 – Other Measures

- Option 3A: Building a Fourth Road Harbour Crossing or Expanding the Capacity of CHT
- Option 3B: Restricting the Use of CHT
- Option 3C: Enhancement of Ferry Services

6. We maintain an open mind on these suggestions, and will explore their feasibility, cost-effectiveness and constraints in detail. We consider that whichever option is selected must be able to meet the following principles: –

- (a) it should bring about overall benefit to the public;

- (b) it should be fair to taxpayers; and
- (c) it should help alleviate traffic congestion in the tunnels and on the adjacent strategic roads and junctions.

7. Where the option involves changes to the ownership or franchises of existing crossings, the following additional principles would also be of paramount importance: –

- (a) there should be a fair valuation of the road harbour crossings, especially CHT, as it is a valuable public asset;
- (b) it should make commercial sense to the franchisee(s); and
- (c) it should be accompanied by a toll adjustment mechanism that is acceptable to the public, the Government and the tunnel franchisees.

Securitisation of Tunnel Revenue

8. With the securitisation of revenue of Government tolled tunnels and bridges (the Hong Kong Link transaction) completed in May 2004, the following considerations will also have to be taken into account in assessing the various options: –

- (a) While the Government is not restricted under the Hong Kong Link transaction from adjusting the tolls of CHT, if there is a reduction in the toll revenue⁴, the Government may be required to make “Direct Payment”⁵ for bond repayment purposes to make up the difference; and
- (b) The toll revenue generated by CHT currently accounts for some 60% of the total net toll revenue of the securitised facilities under the Hong Kong Link transaction. If the Government wishes to remove CHT from the transaction (i.e. to cease using tolls receivable from CHT for bond repayment),

⁴ If the toll revenue received is reduced by certain specified proportions within three months following a toll reduction or six months following a toll increase.

⁵ From sources other than the toll revenue from the securitised facilities.

it will have to fulfill certain requirements⁶, which will likely involve compensating the bondholders or redeeming the bonds in full.

Options

9. The following paragraphs set out the various options that may help to improve the distribution of traffic among the three road harbour crossings, the likely impact of each measure, as well as the major considerations and constraints involved.

Option 1A: Overall Increase in CHT Tolls

10. This is essentially a Congestion Charge. From a pure economics and traffic management point of view, raising the overall toll levels at CHT should be the most direct and effective way to improve the traffic distribution among the three tunnels and reduce congestion at CHT. CHT enjoys geographical advantages and has always been a natural attraction to motorists, even if its tolls are at the same level as those of the other two road harbour crossings. This option would have financial impact on all CHT users, whether they use CHT at peak or non-peak hours.

11. The following are the major considerations for this option: –
- (a) There would be no cross-subsidy of any form between non-CHT users and CHT users.
 - (b) However, the impact could be reduced if WHC and/or EHC also adjust their toll levels upward.
 - (c) As mentioned in paragraph 8, under the Hong Kong Link transaction, such “upward toll adjustment” may cause the Government to make Direct Payment to the bondholders.

⁶ If the Government seeks to remove CHT from the Hong Kong Link transaction before 2011 when all the retail bonds will have matured, it must either obtain the confirmation that such arrangement will not cause the rating agencies concerned to downgrade the credit rating of the institutional notes and retail bonds, or obtain the consent of at least 75% of the holders of each tranche of the institutional notes and retail bonds to such arrangement (probably by paying financial compensation to the satisfaction of these bondholders). After 2011, the Government will have to redeem the Toll Revenue Bond in full (which would result in all institutional notes and retail bonds being redeemed in full) in order to remove CHT from the transaction.

- (d) Raising tolls at CHT will require amendments to the Road Tunnels (Government) Regulations.
- (e) There would be considerable opposition from users of CHT.

Option 1B: Peak Hour Surcharge at CHT

12. This is a variation to Option 1A. It seeks to impose a surcharge on vehicles using CHT during peak hours⁷. Such a measure will limit the impact to motorists using CHT during those hours, and would allow more choices for motorists.

13. The following are the major considerations: –

- (a) There would be no cross-subsidy of any form between non-CHT users and CHT users.
- (b) There may be operational problems, with some motorists rushing through the toll booths before the start of the peak hour, or slowing down at the approach roads towards the end of the surcharge period. This may adversely affect the smooth and safe operation of CHT and its approach roads.
- (c) The traffic situation outside the peak hours may worsen, thus lengthening the journey time for those motorists who habitually use CHT outside the peak hours.
- (d) As mentioned in paragraph 8, under the Hong Kong Link transaction, such “upward toll adjustment” may cause the Government to make Direct Payment to the bondholders.
- (e) Even though it only applies during peak hours, the surcharge falls within the “tolls” defined in the Road Tunnels (Government) Ordinance, and legislative amendments would be required.

Option 1C: Surcharge and Rebate at CHT

14. This option is a further variation to Options 1A and 1B. It seeks to impose a surcharge at CHT, but at the same time “rebate” CHT

⁷ For example, 8 – 9 am and 6 – 8 pm on weekdays.

users with coupons of the same value that would enable holders to use WHC/EHC at a discounted rate. In other words, it uses the additional revenue at CHT to sponsor the use of WHC/EHC.

15. The following are the major considerations: –
- (a) This option involves complex logistical arrangements in distributing coupons at the toll booths and also accounting arrangements in redeeming the coupons.
 - (b) As motorists would have to use CHT in order to obtain the coupons for use at WHC/EHC, it would be less effective in diverting traffic to the other two harbour crossings when compared with Options 1A & 1B above.
 - (c) There may be concerns over the provision of cash subsidy to private enterprises i.e. the WHC and EHC franchisees.
 - (d) There could be trading activities between regular CHT users and non-CHT users. Social problems aside, this would also further affect the scheme's traffic impact.
 - (e) It is not certain at this stage whether the Government can lawfully use toll revenues (including proceeds from the surcharge) of CHT to redeem the coupons. If this is not viable, then this option would involve additional expenditure from the public coffers, which would be extremely difficult, given that the Government has undertaken to contain public expenditure.
 - (f) As mentioned in paragraph 8, under the Hong Kong Link transaction, such "upward toll adjustment" may cause the Government to make Direct Payment to the bondholders.
 - (g) Imposing the surcharge at CHT would require amendments to the Road Tunnels (Government) Ordinance.

Option 1D: Variable Toll Adjustment System at CHT

16. This is essentially a flexible toll adjustment system, under which the toll at CHT would be determined according to the congestion

level. Indicators, such as CHT's throughput, or the queue lengths on approach roads, or the time required to go through CHT, may serve as the basis for such adjustments. Theoretically, the system would be more effective in regulating tunnel traffic if toll adjustments could be effected within a short period of time. However, this may lead to frequent changes to the toll levels and cause immense confusion. Hence, a more balanced approach is perhaps to adopt a regular toll adjustment interval of 6-12 months.

17. The following are the major considerations: –
- (a) Conceptually, this mechanism is a fair and flexible one, as the toll level at CHT is dependent upon some objective criteria, and in times of low traffic throughput, CHT users may enjoy a toll reduction.
 - (b) It may not be easy to identify a set of suitable and widely acceptable indicators and the related threshold as the basis for making toll adjustments. The average queue length is a possibility but the impact of traffic accidents and vehicle breakdowns which cause short-term queues might have to be discounted. Daily throughput at CHT is another possible indicator but does not take into account the distribution of traffic between peak hours and non-peak hours.
 - (c) There would be uncertainty for some trades, such as public transport operators, in estimating the cost of using CHT.
 - (d) As mentioned in paragraph 8, under the Hong Kong Link transaction, such “upward toll adjustment” may cause the Government to make Direct Payment to the bondholders.
 - (e) Substantive amendments to different transport-related legislation will be required.

Option 1E: Toll Increase at CHT and Toll Reduction at WHC/EHC

18. This is another variation to the former four options. Instead of only raising the tolls at CHT, this option also involves a toll reduction at WHC and/or EHC. One suggestion even goes further as to swapping the toll regimes of CHT and WHC. Advocates for this move consider that it

would help redistribute traffic, while at the same time minimize the additional financial impact to users.

19. In assessing this option, we need to consider the following: –
- (a) As EHC and WHC are operated under BOT franchises, pursuing this option would require agreement of the franchisees as it involves toll reduction at WHC and EHC.
 - (b) It would be necessary to make assumptions and projections on the resulting traffic throughput and toll revenue after the new tolls have been implemented. There may be a need for further adjustment if the actual throughput or toll revenue deviates from the projected level.
 - (c) If the changes lead to a reduction in the toll revenue at WHC/EHC, the respective franchisees may seek compensation from the Government.
 - (d) Similar to the earlier options, under the Hong Kong Link transaction, such “upward toll adjustment” may cause the Government to make Direct Payment to the bondholders.
 - (e) Appropriate legislative amendments may be required for such a system to be put in place.

Option 2A: Buying out the Franchises of EHC and WHC

20. There are suggestions that the Government should buy out the franchises of EHC and WHC. Some even suggest further that a Tunnels and Bridges Authority should be established to manage all the tunnels. Supporters of this idea believe that since the Government will take full control of all the three road harbour crossings, and it may not need to seek as high a return as that for private companies, there will be more room for toll adjustment to facilitate better traffic distribution.

21. However, there are several aspects we should consider: –
- (a) A fundamental question is whether the franchisees are interested in this option, and if so, the price involved. There is a risk that the Government will have to pay over the odds.

- (b) Substantial funding would be required.
- (c) Following from (b), there are suggestions that bonds may be issued to fund the purchase of EHC and WHC if we do not wish to incur huge expenditure from the public coffer. In this connection, it must be noted that if the toll levels of EHC and WHC were set at a low level, it would be extremely doubtful whether they could generate sufficient toll revenue to service the interest payments and principal repayment of any bonds issued for this purpose.
- (d) This would be against the principles of “small government, big market” and “market leads, government facilitates”.

Option 2B: Selling CHT to Franchisees of EHC and WHC

22. Advocates of this idea believe that selling CHT to the major shareholder of WHC and EHC might allow all three road harbour crossings to be under one single ownership. In order to maximize the overall profit of the three crossings, it might be desirable to align the toll regimes and reduce the toll differentials.

23. This option may however have the following implications: –

- (a) Similar to Option 2A, a fundamental question is whether the franchisees would be interested in this option.
- (b) There are concerns that this option may lead to a monopoly situation where a private enterprise would have control over all three tunnels.
- (c) This option would involve negotiation over the valuation of CHT. Such may not be easy, given that the commercial interests of private enterprises differ substantially from the wish of the public and the Government to preserve the value of CHT, an important public asset.
- (d) As mentioned in paragraph 7(c), it will be necessary to work out a toll adjustment mechanism. For the franchisee, unless there is an agreed mechanism, it would be difficult to ensure

that they would be able to secure the intended rate of return for the tunnels. To the motorists, having such a mechanism in place may prevent sudden large toll increases in any one of the three tunnels in the future. However, given the very different considerations, it may prove difficult to reach agreement on this important issue.

- (e) Selling CHT will have major implications for the Hong Kong Link transaction, as set out in paragraph 8.

Option 2C: Common Ownership for CHT, EHC and WHC

24. This option seeks to establish a holding company with the Government and the franchisees of EHC and WHC each having a shareholding that is commensurate with the value of the respective crossing owned. The major advantage is that with common ownership, the traffic throughput and toll revenue at individual tunnels would not then be the primary concern of their original franchisee, as they may also benefit from increase in toll revenue of the other tunnels. Such would be conducive to establishing a common toll regime that would facilitate better traffic distribution.

25. The following would be the major considerations: –

- (a) Similar to Options 2A & 2B, a fundamental question is whether the franchisees are interested in this option.
- (b) Again, this option would involve negotiation over the valuation of CHT, which may not be easy.
- (c) Similarly, it will be necessary to work out a toll adjustment mechanism that is acceptable to the franchisees, the Government and the public.
- (d) There may be implications under the Hong Kong Link transaction, as set out in paragraph 8 above.
- (e) Apart from the valuation and toll adjustment mechanism, it will also be necessary to negotiate with the franchisees on complex issues such as the franchise duration, the future management framework, the operating cost, the handling of

debts, the profit and loss situation etc.

- (f) Major revamp of the existing ordinances and enactment of new legislation would be required to provide the legal basis for such a common ownership.

Option 2D: Extension of Franchises of EHC and WHC

26. This option seeks to secure the agreement of the franchisees of EHC and WHC to reduce their tolls, and to “compensate” the loss in revenue by extending their franchises.

27. The following are the major considerations: –

- (a) Similar to Options 2A to 2C, a fundamental question is whether the franchisees of WHC and EHC would be willing to consider this option.
- (b) While this option has no immediate financial implications to the public coffers, there will be implications on the future toll revenue that should be credited to the General Revenue after the franchise has expired. Forgoing such revenue for the duration of the extended franchise would mean that future taxpayers would subsidize current and future motorists.
- (c) It may not be easy to agree on the duration of the franchise extension, as this involves different traffic and financial projections, and also the need to reconcile the different interests of the franchisees, the tunnel users and the Government.

Option 3A: Building a Fourth Road Harbour Crossing or Expanding the Capacity of CHT

28. There are suggestions that the Government should consider constructing a fourth crossing, which could take the form of a tunnel or a bridge. One more specific proposal is to build an additional crossing adjacent to CHT, so as to expand the latter’s capacity, but at the same time using the same connecting road network. These are rather ambitious ideas, and there are quite a number of issues that need to be considered: –

- (a) Technically, this would not be an easy option, given the need to identify suitable sites with sufficient space for the ingress, egress, connecting roads and other infrastructure.
- (b) Our current problem is the uneven distribution of cross-harbour traffic, rather than the adequacy or otherwise of the total capacity of the tunnels. Hence, building a fourth crossing might not necessarily resolve the problem as it would only raise the overall capacity but may not change the preference of motorists.
- (c) Timing is also a concern. Even if we were able to address the technical issues, it would take many years before the new crossing could be completed. This would not help alleviate the traffic problem in the short to medium term.
- (d) If the BOT mode were not adopted for this new crossing, then this option would involve substantial capital cost⁸. In addition, for Government-owned infrastructure, whether the eventual toll level would be sufficient to meet the operation, management and maintenance cost in future would be doubtful.

Option 3B: Restricting the Use of CHT

29. It has been suggested that some restrictive measures might help tackle the traffic imbalance. One example is to restrict certain types of vehicles to use CHT during peak hours. Another example is to allow vehicles with odd and even licence number plates to use CHT on alternate days of a week.

30. In assessing this option, we will need to consider the following: –

- (a) This option would not involve any toll adjustment, and thus should bring about the least financial impact to the users, the Government and the tunnel franchisees.

⁸ For instance, the construction cost of WHC, which was built between 1993 and 1997, was over \$7 billion. As for the annual cost for management and maintenance of a tunnel, we estimate that it should be around \$100 million each year.

- (b) The major disadvantage would be the limitation of choice to motorists. Whether the restriction applies to specific vehicle types or to odd/even licence number plates, some motorists will be barred from using CHT at certain times.
- (c) Enforcement might not be easy, and the CHT contractor could face immense administrative and logistical problems.
- (d) Legislative amendment to provide for such restrictions and the associated penalties would be necessary.

Option 3C: Enhancement of Ferry Services

31. Currently, there are ten passenger ferry services across the harbour, but there is no regular vehicular ferry service⁹. There are suggestions that new passenger and vehicular ferry services may relieve the pressure on the tunnels. While ferries should theoretically be an alternative to tunnels for crossing the harbour, experiences show that ferry services may not be as attractive¹⁰ as other land-based transport modes, because: –

- (a) Ferry piers have to be located at the waterfront and hence are often further away from the population/activity centres. Commuters generally prefer more direct transport services to making interchanges.
- (b) Because of the low passenger demand and the need to control cost, most ferry routes operate at a relatively low frequency of 15 to 20 minutes¹¹, and older vessels that are less comfortable and of slower speed are deployed.

⁹ The only exceptions are two services for dangerous goods vehicles, one between North Point and Kowloon City and another between North Point and Kwun Tong/Mui Wo. There is also one emergency vehicular ferry service between North Point and Kwun Tong/Mui Wo which will be operated within two hours upon notification by the Commissioner for Transport during emergency situation.

¹⁰ In 2004, inner harbour passenger ferry services carried about 92,000 passenger trips a day and accounted for 0.8% of the total transport patronage. Between the 1970s and 2004, while the overall public transport demand has doubled, the market share of ferry services has dropped from about 13.9% to 1.4%. The patronage of vehicular ferry services has also declined so much that they have become not viable commercially. The last ferry service ceased operation in 1998 due to persistent loss.

¹¹ Except for two routes operated by the Star Ferry at 4 to 8 minutes' intervals.

- (c) Land-based transport modes can provide intermediate stops in population/activity centres, which in turn could generate passenger turnover and fare revenue. The scope of such flexibility is very limited for ferry operation.
- (d) Given the abovementioned inherent constraints and operation difficulties, there may not be immense commercial interest in operating additional ferry services, particularly vehicular ferry services.

In brief, the scope for using passenger/vehicular ferry services to relieve pressure on the three road harbour crossings should be very limited.

ADVICE SOUGHT

32. Members are invited to comment on the various options in this paper.

Environment, Transport and Works Bureau
April 2005

Average Daily Distribution of Cross-harbour Traffic by Transport Modes in 2004

Vehicle Type	Cross Harbour Tunnel		Eastern Harbour Crossing		Western Harbour Crossing		Total Cross Harbour Daily Traffic	
Motorcycles	5,186	4.3%	2,954	4.0%	443	1.1%	8,583	3.7%
Private cars	45,338	37.3%	41,157	56.0%	21,436	54.7%	107,931	46.1%
Taxis	32,577	26.8%	10,318	14.0%	6,438	16.4%	49,333	21.1%
Light Buses	3,165	2.6%	1,114	1.5%	2,450	6.3%	6,729	2.9%
Light Goods Vehicles	21,064	17.3%	11,873	16.2%	3,436	8.8%	36,373	15.5%
Medium Goods Vehicles	3,461	2.8%	2,756	3.8%	637	1.6%	6,854	2.9%
Heavy Goods Vehicles	799	0.7%	319	0.4%	60	0.2%	1,178	0.5%
Single Deck Buses	3,807	3.1%	579	0.8%	1,142	2.9%	5,528	2.4%
Double Deck Buses	6,274	5.2%	2,407	3.3%	3,146	8.0%	11,827	5.0%
Total Daily Traffic	121,671	100.0%	73,477	100.0%	39,188	100.0%	234,336	100.0%