

# Proposed Measures to Improve the Traffic Distribution among the Road Harbour Crossings



## Public Consultation



**Transport and Housing Bureau**  
The Government of the Hong Kong Special Administrative Region

## **Proposed Measures to Improve the Traffic Distribution among the Road Harbour Crossings**

### **(A) Background**

#### ***Problem***

The public has expressed concern about traffic congestion at the Road Harbour Crossings (“RHCs”) and related traffic problems. With its central location and connectivity, plus the significantly lower toll charges as compared with those of the other two RHCs, the Cross Harbour Tunnel (“CHT”) is the most heavily utilised among all three RHCs, with a daily throughput of about 120 000 vehicles that far exceeds the tunnel’s design capacity of 78 000 vehicles per day. During peak hours, extensive queues are commonly observed at CHT’s connecting roads on both sides of the entrances, which block the non-cross-harbour traffic. We need to adopt measures to divert traffic from CHT to the other RHCs, thereby improving the traffic distribution among the three RHCs and alleviating the traffic congestion at CHT.

#### ***Current Situation***

- **CHT** has a daily average traffic throughput of about 120 000 vehicles while its design capacity is 78 000 vehicles.
- Eastern Harbour Crossing (“**EHC**”) has a daily average traffic throughput of about 70 000 vehicles, while its design capacity is 78 000 vehicles.
- Western Harbour Crossing (“**WHC**”) has a daily average traffic throughput of about 60 000 vehicles while its capacity limit<sup>1</sup> is 55 000 vehicles.

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<sup>1</sup> Although the WHC itself has spare capacity, its connecting roads, in particular those in Central, are already congested. Considering the constraints of its connecting roads, WHC’s capacity is limited to 55 000 vehicles.

***Consultancy study on rationalising the utilisation of the RHCs and public consultation in 2010/2011***

2. The Government commissioned in November 2008 a consultancy study on rationalising the utilisation of the RHCs for a comprehensive analysis of relevant factors that affect the distribution of traffic amongst the three RHCs with an objective of identifying the optimum level of traffic for the three RHCs, taking into account their geographic locations and the capacity of connecting road networks, and recommending feasible options that cover the necessary financial, organisational and legal mechanisms to achieve the optimum traffic situation. The consultancy study was completed in September 2010. According to the consultants' recommendations, to achieve the objective of rationalising traffic flow at the three RHCs, the tolls for CHT must be increased whilst those for EHC reduced so as to divert some traffic from CHT to EHC.

3. Subsequently, the Government completed, in the first quarter of 2011, a 3-month public consultation exercise on the findings and recommendations of the consultancy study. We received 70 submissions during the consultation period and consulted various stakeholders such as the Legislative Council ("LegCo") Transport Panel, Transport Advisory Committee ("TAC"), relevant District Councils ("DCs"), academics and experts, as well as the transport trades. While some consultees agreed that toll adjustment was one of the prerequisites in achieving better traffic distribution among the three RHCs, others, especially the transport trades and LegCo Members, urged the Government to freeze the tolls for public transport vehicles and minimise the impact of any toll adjustments on goods vehicles. There were also suggestions that Government should buy back WHC and/or EHC.

**(B) Suggested options**

***Toll adjustment options***

4. In the light of the views received during public consultation, we have been studying and fine-tuning some of the toll adjustment options as recommended by the consultants to address the public and the trade's concerns, with a view to putting forward refined toll adjustment options for further public consultation. We have come up with three possible options, all of which could reduce the traffic queue at CHT by 30 to 40%, bringing about a notable improvement to the current congestion at CHT.

All three options will bring positive economic and environmental benefits to the society as a whole, such as reduction in travel time and vehicle maintenance fees, and reduction in vehicle emission. The main features of the three options are summarised as follows –

(a) Option A (Resource Management Option) :

- **reduce EHC private car (“PC”) toll by \$5 and those of other types of vehicles correspondingly, such that the tolls would be closer to the CHT tolls after adjustment as stated below;**
- **increase CHT PC toll by \$5 and increase tolls of other vehicle types in accordance with the resource management principle<sup>2</sup>, so as to reflect the road space occupied as well as the wear and tear caused on the road by these vehicles as appropriate;**
- **forecast to bring about 40% queue reduction at CHT during rush hours** (reduction of about 4 100 vehicles per day), such that cross-harbour traffic queues will no longer interfere with non-cross-harbour traffic;
- **estimated overall economic benefits<sup>3</sup> up to \$560 million per year; and**
- **this option was one of the options recommended in the consultancy study, and was also the option supported by TAC in the last round of consultation.**

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<sup>2</sup> According to resource management principle, larger vehicles should pay more than smaller vehicles as they occupy more road space and cause more wear and tear on road surface. Under the current toll structure of CHT, tolls payable by larger vehicles in using CHT is only marginally higher than that by smaller vehicles. Currently, the ratio of the toll of heavy goods vehicle (“HGV”) to that of PC at CHT is 1.5:1, while the toll of taxi is only half of that of PC. Tolls of EHC and WHC are set with more regard to the resource management principle. The ratio of the toll of HGV to that of PC at EHC is 3:1 and the taxi toll is the same as the PC toll, while the toll of HGV to that of PC at WHC is 2.2:1, with the taxi toll similar to that of PC. Adjusting the toll structure of CHT closer to the resource management principle would mean larger toll increase for larger vehicles than smaller vehicles.

<sup>3</sup> The savings in costs include savings in fuel costs and vehicle maintenance fees, and shortened travel time.

(b) Option B (EHC Reduction CHT Increase Option) :

- **reduce EHC PC toll by \$5;**
- **increase CHT PC toll by \$5;**
- **adjust the tolls of other vehicle types at both EHC and CHT proportionally in accordance with their original toll structure respectively (with no change in toll structure);**
- **forecast to bring about 30% queue reduction at CHT during rush hours** (reduction of about 3 000 vehicles per day);
- **when compared with Option A and Option C, the queue reduction at CHT during rush hours forecast to be brought by Option B is smaller.** Although these would be a notable improvement to the current congestion, non-cross-harbour traffic would still be affected to some extent;
- **estimated overall economic benefits up to \$530 million per year;** and
- this option was one of the options recommended in the consultancy study.

(c) Option C (Status Quo for Public Transport Option) :

- **similar to Option B except that the tolls for public transport vehicles will be frozen;**
- **the reduction in tolls of goods vehicles at EHC is larger than the increase in tolls of goods vehicles at CHT, the differential of which is the largest among the three options, and has the least impact on the goods vehicles trade;**
- **EHC PC toll will be reduced by \$5 while the increase in PC toll at CHT will be \$10 instead of \$5;**

- this is a **new option devised in the light of the feedback received during the last round of public consultation**. It has addressed the calls from the public to freeze public transport tolls and the requests of the goods vehicles trade to minimise the impact of toll adjustment on goods vehicles;
- forecast to bring about **38% queue reduction at CHT during rush hours** (reduction of about 4 200 vehicles per day), such that cross-harbour traffic queues will no longer interfere with non cross-harbour traffic;
- estimated **overall economic benefits up to \$520 million per year**.

Among the three options mentioned above, Option A rationalises the toll structure of CHT such that it is more consistent with the resource management principle. Option C is a new option devised in the light of the feedback received during the last round of public consultation and has responded to the calls from the public and the transport trade. Cross-harbour traffic queue at CHT would not interfere with non-cross-harbour traffic under both options, such that the objective of rationalising the traffic distribution among the three RHCs could be achieved. As for Option B, although it would notably improve the current congestion at CHT, non-cross-harbour traffic would still be affected to some extent. Details of the three options are summarised at [Annex](#).

***Effecting downward toll adjustment at EHC through providing reimbursement to tunnel users***

5. We propose effecting the downward toll adjustments at EHC through reimbursing the tunnel users. Under such arrangement, the EHC franchisee will collect the reduced tolls from tunnel users. The Government will, on behalf of the tunnel users, pay the EHC franchisee the difference between the existing tolls and the reduced tolls at EHC based on actual traffic flow. The formula for calculating the reimbursement by the Government for tunnel users is broadly as follows –

$$\boxed{\text{Reimbursement}} = \boxed{(\text{Existing toll} - \text{Reduced toll paid by tunnel users})} \times \boxed{\text{Actual Vehicle Trips}}$$

6. As the reimbursement amount will be determined based on actual vehicle trips, it is straightforward to administer and easy to monitor from an auditing angle. We estimate that the amount of reimbursement would range from about \$160 million to \$270 million per year depending on which toll adjustment option is to be implemented.

7. On the other hand, we estimate that there will be additional revenue from increasing CHT tolls ranging from \$150 million to \$430 million per year, depending on which toll adjustment option is to be implemented. Taking into account such additional revenue, the net financial implication to the Government would range from a revenue of about \$160 million to an expenditure of about \$50 million per annum.

**(C) Other options**

***(i) Toll adjustment option involving only reduction in EHC tolls***

8. There were suggestions that we should only reduce EHC tolls and maintain status quo for CHT tolls. According to economic principles and the results of computer modelling, this option would induce additional vehicular traffic and generate additional cross-harbour traffic. Traffic at EHC would become heavier due to the traffic diverted from CHT as well as some of the additional cross-harbour traffic. It is estimated that the EHC traffic queue on the Kowloon side will extend beyond the Tseung Kwan O Road/Lei Yue Mun Road junction. CHT would remain congested because the resulting relief thereat would be much offset by the newly generated cross-harbour traffic, projected to increase by about 1.5% immediately and about 6% in five years' time, and some traffic would also be diverted from WHC<sup>4</sup>. Therefore, the toll

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<sup>4</sup> For instance, if EHC PC toll is to be reduced by \$10 to \$15 while CHT PC toll is kept at \$20, around 5 900 vehicles per day originally using CHT are expected to switch to EHC due to the EHC toll reduction. A less congested CHT would in turn attract 4 100 vehicles from WHC. In addition, new cross-harbour traffic in the order of 3 700 vehicles would be generated. EHC, in addition to the 5 900 vehicles from CHT, would receive 2 900 vehicles out of the newly generated cross-harbour traffic, thereby increasing the traffic at EHC by a total of 8 800 vehicles.

reduction at EHC must be complemented by toll increase at CHT in order to effectively alleviate congestion at CHT and rationalise the traffic distribution among the three RHCs. Otherwise, we would create a situation that is even worse than the status quo. Therefore, we do not recommend this option.

***(ii) Toll adjustment for WHC***

9. We have considered reducing tolls at WHC to divert traffic from CHT. We have decided against such a measure because although the WHC itself has spare capacity, its connecting roads, in particular those in Central, are already congested. These roads will not be able to cope with additional traffic during the morning and evening rush hours. This constraint may only be overcome when the Central-Wanchai Bypass comes into operation in end 2017.

**(D) Implementation timetable**

10. We are conducting a 3-month public consultation exercise from February to May 2013 on the proposed toll adjustment options outlined in paragraph 4. We will consult relevant stakeholders, including the LegCo Panel on Transport, TAC, the relevant DCs and the transport trade. We will also upload this consultation document to the website of the Transport and Housing Bureau (<http://www.thb.gov.hk/eng/index.htm>) for public consumption. Members of the public may send their views to the Transport and Housing Bureau on or before 7 May 2013 via the following means -

By post : Transport and Housing Bureau (c/o Team 2)  
20/F - 22/F, East Wing,  
Central Government Offices,  
2 Tim Mei Avenue,  
Tamar, Hong Kong

By fax : 3904 1774  
By e-mail : [rhc@thb.gov.hk](mailto:rhc@thb.gov.hk)



Please state in the submissions or on the envelopes that the views are related to this consultation<sup>Note</sup>.

11. Depending on the outcome of public consultation, we will discuss with the EHC franchisee how to implement the selected toll adjustment option. Taking into account the time required to conduct public consultation, negotiate with the EHC franchisee, and enact the necessary legislative amendments, we expect to conduct a 12-month trial in the second half of 2014 at the earliest. We will review the outcome of the trial before deciding whether the toll adjustments should continue. This trial scheme would serve as important reference for the long term rationalisation arrangement for the three RHCs after the transfer of ownership of EHC back to the Government in 2016.

12. We are open-minded in this consultation exercise and hope that a consensus could be reached within the community as soon as possible. After the most preferred toll adjustment option has been selected, we will discuss with the tunnel franchisee on the implementation, seek funding from the Finance Committee of LegCo and submit the legislative amendment proposals to LegCo, with a view to implementing a 12-month trial beginning in the 3<sup>rd</sup> quarter of 2014 to test its effectiveness.

**Transport and Housing Bureau  
February 2013**

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<sup>Note</sup> All submissions will normally be made available to the general public upon request, and may be published in their original form (including senders' names, but with other personal information such as email addresses removed) as part of the consultation report, unless the contributors ask specifically to keep their views confidential.

**Key features of the  
three toll adjustment options**

	<b>Option A (Resource Management Option)</b>	<b>Option B (EHC Reduction CHT Increase Option)</b>	<b>Option C (Status Quo for Public Transport Option)</b>
<b>Toll adjustment features</b>	<ul style="list-style-type: none"> <li>• reduce EHC private car (“PC”) toll by \$5 and those of other types of vehicles correspondingly, such that the tolls would be closer to the CHT tolls after adjustment as stated below</li> <li>• increase CHT PC toll by \$5 and increase tolls of other vehicle types in accordance with the resource management principle, so as to reflect the road space occupied as well as the wear and tear caused on the road by these vehicles as appropriate</li> <li>• see <u>Table</u> for detailed tolls</li> </ul>	<ul style="list-style-type: none"> <li>• reduce EHC PC toll by \$5</li> <li>• increase CHT PC toll by \$5</li> <li>• adjust the tolls of other vehicle types at both EHC and CHT proportionally in accordance with their original toll structure respectively (with no change in toll structure)</li> <li>• see <u>Table</u> for detailed tolls</li> </ul>	<ul style="list-style-type: none"> <li>• reduce EHC PC toll by \$5</li> <li>• the reduction in tolls of goods vehicles at EHC is larger than the increase in tolls of goods vehicles at CHT, the differential of which is the largest among the three options, and has the least impact on the goods vehicles trade</li> <li>• increase CHT PC toll by \$10</li> <li>• tolls of public transport vehicles will be frozen</li> <li>• see <u>Table</u> for detailed tolls</li> </ul>
<b>Traffic assessment</b>			
Queue reduction at CHT	• 40%	• 30%	• 38%

	<b>Option A (Resource Management Option)</b>	<b>Option B (EHC Reduction CHT Increase Option)</b>	<b>Option C (Status Quo for Public Transport Option)</b>
<b>Economic assessment</b>			
<b>Overall economic benefits</b>	<ul style="list-style-type: none"> <li>operators of buses/public light buses will pay lower tolls at EHC and higher tolls at CHT but overall will benefit from savings in operating costs and travel time; passengers will benefit from shorter journey time</li> <li>estimated overall economic benefits up to \$560 million per year</li> </ul>	<ul style="list-style-type: none"> <li>operators of buses/public light buses will pay lower tolls at EHC and higher tolls at CHT but overall will benefit from savings in operating costs and travel time; passengers will benefit from shorter journey time</li> <li>estimated overall economic benefits up to \$530 million per year</li> </ul>	<ul style="list-style-type: none"> <li>tolls for buses/public light buses will remain unchanged and operators will benefit from savings in operating costs and travel time; passengers will benefit from shorter journey time</li> <li>estimated overall economic benefits up to \$520 million per year</li> </ul>
Cost Savings <sup>Note</sup>			
(i) Savings in costs in respect of private vehicles	<ul style="list-style-type: none"> <li>estimated annual savings up to \$270 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$180 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$150 million</li> </ul>
(ii) Savings in costs in respect of taxis	<ul style="list-style-type: none"> <li>estimated annual savings up to \$40 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$100 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$100 million</li> </ul>
(iii) Savings in costs in respect of goods vehicles	<ul style="list-style-type: none"> <li>estimated annual savings up to \$20 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$60 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$140 million</li> </ul>

	<b>Option A (Resource Management Option)</b>	<b>Option B (EHC Reduction CHT Increase Option)</b>	<b>Option C (Status Quo for Public Transport Option)</b>
(iv) Savings in costs in respect of public transport	<ul style="list-style-type: none"> <li>estimated annual savings up to \$40 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$170 million</li> </ul>	<ul style="list-style-type: none"> <li>estimated annual savings up to \$160 million</li> </ul>
<b>Financial implications to Government (annual)</b>	Reimbursement for EHC tunnel users (R to EHC) : -269M  CHT Additional Toll Revenue (TR) : 433M  Net : <b>164M</b>	R to EHC : -163M  CHT Additional TR : 152M  Net : <b>-11M</b>	R to EHC : -216M  CHT Additional TR : 169M  Net : <b>-47M</b>

Note : The costs include tunnel tolls, operating costs (such as fuel costs and maintenance fees) and travel time costs.

# Table

## Tolls under the three toll adjustment options

	Option A (Resource Management Option)			Option B (EHC Reduction CHT Increase Option)			Option C (Status Quo for Public Transport Option)		
	CHT	EHC	WHC	CHT	EHC	WHC	CHT	EHC	WHC
Private cars	25 (+5)	20 (-5)	55	25 (+5)	20 (-5)	55	30 (+10)	20 (-5)	55
Motorcycles	12 (+4)	9 (-4)	25	10 (+2)	10 (-3)	25	12 (+4)	9 (-4)	25
Taxis	19 (+9)	15 (-10)	50	13 (+3)	20 (-5)	50	10	15 (-10)	50
Empty taxis	14 (+4)	11 (-4)	50	13 (+3)	12 (-3)	50	10	15	50
Light goods vehicles	28 (+13)	23 (-15)	65	19 (+4)	30 (-8)	65	19 (+4)	23 (-15)	65
Medium goods vehicles	38 (+18)	30 (-20)	90	25 (+5)	40 (-10)	90	25 (+5)	30 (-20)	90
Heavy goods vehicles	56 (+26)	45 (-30)	120	38 (+8)	60 (-15)	120	38 (+8)	45 (-30)	120
Additional axle for goods vehicles	19 (+9)	15 (-10)	30	13 (+3)	20 (-5)	30	13 (+3)	15 (-10)	30
Public light buses	25 (+15)	20 (-18)	65	13 (+3)	30 (-8)	65	10	38	65
Single-decked buses	31(+21)	25 (-25)	100	13 (+3)	40 (-10)	100	10	50	100
Double-decked buses	47 (+32)	38 (-37)	140	19 (+4)	60 (-15)	140	15	75	140



Toll remains unchanged



Increase in Toll



Reduction in Toll