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Panel on Transport

Meeting on 15 March 2013

Background brief on installation of "stop-and-go" e-payment facilities at Government tolled roads and tunnels

Purpose

This paper provides background to the installation of "stop-and-go" e-payment facilities at Government tolled roads and tunnels.

Background

2. It is the Government's policy to provide both manual and automatic toll collection lanes at all tolled tunnels and roads in the territory to allow motorists to choose between making toll payment in cash or electronically according to their needs after taking into account such factors such as the time saving, convenience and cost-effectiveness in using automatic toll collection lanes. Transport Department ("TD") will determine the appropriate number of manual and automatic toll collection lanes at various tolled tunnels and roads in the light of their utilization rates and traffic flows so as to provide road users with a choice in toll payment.

3. At present, both manual and automatic toll collection lanes are available at all tolled tunnels and roads in the territory.

4. According to the observation by TD, given the shorter transaction time of an automatic toll collection lane over a manual toll collection lane, automatic lanes can handle five times the traffic flow of manual toll collection lanes. Hence, although the ratio of automatic toll collection lanes is lower than the utilization rate of such lanes, it is still adequate in meeting the demand of motorists choosing automatic toll payment.

New toll collection system for tunnels and roads

5. At the policy briefing held on 18 January 2013, the Secretary for Transport and Housing informed the Panel on Transport ("the Panel") that the Administration was considering installation of "stop-and-go" e-payment facilities at the manual toll booths of the seven Government tolled tunnels and roads to address the public requests and provide convenience to motorists. According to the Administration, after the new facilities are installed, motorists can choose to use contactless smart card, cash or pre-paid toll ticket to pay tolls.

6. The subject of installation of "stop-and-go" e-payment facilities at Government tolled roads and tunnels has not been discussed by the Panel.

7. In response to questions raised at the Council meetings of 4 May 2011 and 29 June 2011, the Secretary for Transport and Housing advised that the Government kept an open mind about introducing new toll collection systems for tunnels and roads. It had been discussing with the Octopus Cards Limited ("OCL") on the introduction of a Octopus toll collection system for tunnels and roads, and studying the technical feasibility of its proposed toll collection system. The preliminary proposal made by OCL is that its toll collection system would adopt a "stop-and-pay" mode, that is, motorists would need to stop the vehicle at a toll booth and place the Octopus card at the card reader to effect payment. This is similar to a "semi-automatic toll collection system".

8. The Secretary for Transport and Housing advised that in considering the introduction of a new automatic toll collection systems for tunnels and roads, apart from providing another alternative for motorists to pay tolls, it needed to explore the technical feasibility of such a system (such as the interfacing of the proposed system with the existing toll collection system of the tolled tunnels and roads) and other relevant factors, including whether adoption of a Octopus toll collection system could enhance toll collection efficiency, achieve a smoother traffic flow at the tunnel portals as well as its cost effectiveness. Further details are set out in the questions and the Administration's replies in the **Appendix**.

**Questions concerning the toll collection system of
tolled tunnels and roads**

Date of Council meeting	Question	Annex
4.5.2011	Hon CHAN Kam-lam raised a question on toll collection system for tolled tunnels and roads	A
29.6.2011	Hon CHAN Kam-lam raised a question on automatic toll collection system of tolled tunnels and roads	B

Council Business Division 1
Legislative Council Secretariat
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Annex A

Press Releases

LCQ1: Toll collection system for tolled tunnels and roads

Following is a question by the Hon Chan Kam-lam and a reply by the Secretary for Transport and Housing, Ms Eva Cheng, at the Legislative Council meeting today (May 4):

Question:

Given that there have been comments that as motorists may make toll payments for tunnels and roads only by Autotoll or in cash at present, it is inconvenient to them and results in longer time for cars to pass through the toll booths, will the Government inform this Council:

(a) whether it knows the current number of Autotoll accounts, and the percentage of vehicles paying by Autotoll in the total number of vehicles using these tunnels and roads in each of the past five years;

(b) given that the authorities have indicated that they keep an open mind about and encourage the introduction of new toll collection systems for tunnels and roads, whether the Government has discussed with the Octopus Cards Limited the payment of tolls by Octopus cards; if it has, of the progress; if not, the reasons for that; and

(c) whether the Government or tunnel operators had conducted any survey in the past three years to obtain the views of tunnels and roads users on the means of toll payments; whether they had conducted a feasibility study on accepting toll payments by Octopus cards; if they had, of the outcome of the study; if not, the reasons for that?

Reply:

President,

Both manual and automatic toll collection lanes are available in all tolled tunnels and roads in the territory for motorists to pay the toll fee either in cash or electronically. The first automatic toll collection system in Hong Kong was installed by the Autopass Company Limited at the Cross Harbour Tunnel and Aberdeen Tunnel in August 1993. The Electronic Toll Limited then installed another automatic toll collection system at the Tate's Cairn Tunnel in September 1995, and the Shing Mun Tunnels and Tseung Kwan O Tunnel in October 1997. As "Autopass" and "Electronic Toll" were two different systems and were designed separately, if motorists needed to use the tunnels installed with different automatic toll collection systems, they had to apply for two electronic tags and pay administration fees to both companies. This was inconvenient to motorists. Since October 1998, the automatic toll collection systems of all the tolled tunnels and roads have all adopted the "Autotoll" automatic toll collection system.

To subscribe to the "Autotoll" service, a vehicle owner is required to open an account with Autotoll Limited and display a tag containing information of the vehicle concerned on his vehicle. Vehicles with such a tag need not stop at the toll

booth, and the tunnel or road tolls are deducted from the users' account by the toll system management company.

My reply to the three parts of the question is as follows:

(a) There are currently nine tolled tunnels, namely, the Cross-Harbour Tunnel, Eastern Harbour Crossing, Western Harbour Crossing, Lion Rock Tunnel, Aberdeen Tunnel, Shing Mun Tunnels, Tseung Kwan O Tunnel, Tate's Cairn Tunnel and Tai Lam Tunnel, and two tolled roads, namely the Lantau Link and the Tsing Sha Highway (Sha Tin - Cheung Sha Wan Section) in Hong Kong. All of them are equipped with the "Autotoll" automatic toll collection system. According to the information provided by Autotoll Limited, there are currently about 250,000 Autotoll tags in circulation. Between 2006 and 2010, the annual number of vehicles using the "Autotoll" system represents about 40% to 60% of the total traffic flow of individual tolled tunnels and roads. The average utilisation rate of the "Autotoll" system remained at about 50% over the past five years. The utilisation rate of the "Autotoll" system at individual tolled tunnels and roads has been circulated to Members at Annex for reference.

(b) and (c) Vehicles using the "Autotoll" system can save time by not having to stop at the booth to pay the toll. Compared with manual toll collection, the "Autotoll" system can enhance toll collection efficiency at tolled tunnels and roads and is beneficial to the management of tunnel portals.

The Government keeps an open mind about introducing new toll collection systems for tunnels and roads. We have been discussing with the Octopus Cards Limited (OCL) on the introduction of a Octopus toll collection system for tunnels and roads, and studying the technical feasibility of its proposed toll collection system. In considering the introduction of a new automatic toll collection systems for tunnels and roads, apart from providing another alternative for motorists to pay tolls, we need to explore the technical feasibility of such a system (such as the interfacing of the proposed system with the existing toll collection system of the tolled tunnels and roads) and other relevant factors, including whether adoption of a Octopus toll collection system can enhance toll collection efficiency, achieve a smoother traffic flow at the tunnel portals as well as its cost effectiveness.

Further to the discussions between the Government and OCL in recent years, the preliminary proposal made by OCL is that its toll collection system would adopt a "stop-and-pay" mode, that is, motorists would need to stop the vehicle at a toll booth and place the Octopus card at the card reader to effect payment. This is similar to a "semi-automatic toll collection system". We have explored with OCL the technical feasibility of installing its proposed Octopus toll collection system at existing tolled tunnels and roads. OCL considered that Octopus card readers and associated software need to be installed at the existing toll collection system and interfacing problems between the Octopus system and the existing toll collection system would need to be resolved to ensure that the new toll collection system will not affect the operation and reliability of the existing one. OCL's preliminary conclusion is that the proposed system should be technically feasible.

However, apart from technical feasibility, we also need to consider the cost-effectiveness of the relevant proposal. Under the payment mode proposed by OCL, toll collectors still need to

manually select the appropriate toll for each vehicle according to its vehicle category. Therefore, there might not be much manpower savings. Besides, as a motorist still needs to stop the vehicle and present the Octopus card for payment, there may only be slight, if any, improvement to the vehicular flow at the tunnels. Furthermore, there might be unnecessary delays when a motorist's Octopus card does not have sufficient balance. If the toll collection system proposed by OCL were to be adopted, OCL will charge the costs of purchasing and installing the relevant Octopus facilities, as well as the administration and maintenance fees for operating the system. Whether the relevant expenditure is cost-effective requires further study. The Government will continue to explore the above issues with OCL.

Ends/Wednesday, May 4, 2011
Issued at HKT 12:28

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**Utilisation Rate of Autotoll Systems at
Individual Tolled Tunnels and Roads in the Territory**

Tunnel/Road	Utilisation Rate of Autotoll (%)				
	2006	2007	2008	2009	2010
Cross-Harbour Tunnel	39%	39%	39%	39%	40%
Eastern Harbour Crossing	53%	52%	52%	52%	51%
Western Harbour Crossing	60%	58%	58%	58%	57%
Lion Rock Tunnel	48%	48%	47%	47%	46%
Aberdeen Tunnel	53%	52%	52%	53%	52%
Shing Mun Tunnel	44%	44%	44%	44%	43%
Tseung Kwan O Tunnel	48%	47%	47%	48%	47%
Tate's Cairn Tunnel	56%	55%	55%	57%	56%
Tai Lam Tunnel	57%	58%	59%	61%	60%
Lantau Link(1)	48%	47%	47%	47%	46%
Tsing Sha Highway (Sha Tin – Cheung Sha Wan Section)	N/A	N/A	47%	49%	48%
Total	51%	50%	50%	51%	50%

Note: (1) Since the Autotoll service is only available for the traffic leaving Lantau, the number of Autotoll transactions has been doubled to reflect the utilisation rate of the two-way traffic.

Source: Autotoll Limited

Annex B**Press Releases**

LCQ4: Automatic toll collection system of tolled tunnels and roads

Following is a question by the Hon Chan Kam-lam and a reply by the Secretary for Transport and Housing, Ms Eva Cheng, at the Legislative Council meeting today (June 29):

Question:

According to the information of the Transport Department, the overall utilisation rate in February 2011 of the Autotoll toll collection system (Autotoll) at tolled tunnels and roads was only 47%, and that the Autotoll utilisation rate at the Cross Harbour Tunnel in Hung Hom was only 39%. Quite a number of drivers have reflected that owing to insufficient provision of Autotoll lanes at the cross harbour tunnels, there are often long vehicle queues and some drivers who have already opened an account with Autotoll are therefore forced to give up using such lanes and switch to using manual toll booths where the queues are shorter, and thus the automatic toll collection system at the tunnels fails to achieve the effect of easing traffic flow. In this connection, will the Government inform this Council:

(a) whether the authorities have conducted a review on the aforesaid situation, including re-assessing the number of Autotoll lanes available at various tunnels; if they have, of the situation;

(b) whether the authorities have conducted a study on how to facilitate the enhancement of the Autotoll utilisation rate so that the automatic toll collection system can achieve a greater effect in easing traffic flow; and

(c) given the serious traffic congestion at the Cross Harbour Tunnel in Hung Hom, whether the authorities will first consider increasing the number of Autotoll lanes at the Cross Harbour Tunnel in Hung Hom so as to attract more drivers to use the automatic toll collection system and reduce the frequency of long queues appearing at such lanes at present; if they will, of the time of implementation; and whether the authorities will consider converting some of the manual toll collection lanes to Autotoll lanes during rush hours?

Reply:

President,

Both manual and automatic toll collection lanes are available at all tolled tunnels and roads in the territory for motorists to choose between making toll payment in cash or electronically. Since October 1998, all tolled tunnels and roads have adopted the "Autotoll" fully automatic toll collection system.

There are currently nine tolled tunnels, namely the Cross-Harbour Tunnel (CHT), Eastern Harbour Crossing, Western Harbour Crossing, Lion Rock Tunnel, Aberdeen Tunnel, Tseung Kwan O Tunnel, Tate's Cairn Tunnel, Shing Mun Tunnels and Tai Lam Tunnel, and two tolled roads, namely the Lantau Link and Tsing

Sha Highway (Sha Tin - Cheung Sha Wan Section) in Hong Kong. All of them are equipped with automatic toll collection system. The distribution and number of automatic toll collection lanes available at various tolled tunnels and roads are generally determined by the traffic flows of these tunnels and roads, and the utilisation rates of such lanes.

My reply to the three parts of the question is as follows:

(a) and (b) According to the information provided by the Autotoll Limited, there are currently 250,000 Autotoll tags in circulation. At present, automatic toll collection lanes account for about 30% to 40% of the total number of toll collection lanes, while the number of vehicles using such lanes accounts for about 40% to 60% of the total traffic flow at various tolled tunnels and roads.

According to the observation by the Transport Department (TD), given the shorter transaction time of an automatic toll collection lane over a manual toll collection lane, automatic lanes can handle 5 times the traffic flow of manual toll collection lanes. Hence, although the ratio of automatic toll collection lanes is lower than the utilisation rate of such lanes, it is still adequate in meeting the demand of motorists choosing automatic toll payment.

In the case of the CHT, among the 16 toll collection lanes, 6 or 38% are automatic toll collection lanes (i.e. 3 for Kowloon-bound and 3 for Hong Kong Island-bound traffic), while the number of vehicles using such lanes accounts for 39% of the total traffic flow, hence the ratio of automatic toll collection lanes at the CHT is comparable to the utilisation rate of such lanes.

As regards the CHT, when the traffic inside the tunnel tubes becomes congested, some motorists may see longer queues at automatic toll collection lanes than at manual toll collection lanes. This phenomenon is mainly due to more manual toll collection lanes available for vehicles to spread out into different queues. In reality, automatic toll collection lanes handle a higher amount of traffic flow than manual toll collection lanes. Although at times the queues at manual toll collection lanes appear shorter, the actual journey time using automatic toll collection lanes is shorter than using manual toll collection if the actual transaction time is taken into account. According to a site survey conducted by the CHT operator in June 2011, the travelling time (including waiting time in the queue) from near the footbridge connecting to Hong Kong Polytechnic University to the toll booths (about 150 metres) during morning and evening peak hours was slightly more than 50 seconds for using the manual toll collection lanes, and only about 40 seconds for using the automatic toll collection lanes.

TD reviews from time to time the utilisation rates of automatic toll collection lanes at various tolled tunnels and roads and monitors closely their utilisation. If the review findings show that there is a need for increasing the number of automatic toll collection lanes and that such measure would actually be able to improve the traffic flow, and, among other considerations, would not cause inconvenience to users of manual toll collection lanes as a result of a reduction in the number of such lanes, TD will adjust the number of automatic and manual toll collection lanes respectively. In fact, in response to demand, the number of automatic toll collection lanes at the CHT for Kowloon-bound and Hong Kong Island-bound traffic was

increased from 2 to 3 in December 2001 and May 2002 respectively.

It is the Government's policy to provide both manual and automatic toll collection lanes at all tolled tunnels and roads in the territory to allow motorists to choose between making toll payment in cash or electronically according to their needs after taking into account such factors such as the time saving, convenience and cost-effectiveness in using automatic toll collection lanes. TD will determine the appropriate number of manual and automatic toll collection lanes at various tolled tunnels and roads in the light of their utilisation rates and traffic flows so as to provide road users with a choice in toll payment.

(c) Since the existing number of automatic toll collection lanes at the CHT should be able to meet the demand of motorists choosing to use these lanes, and that it takes a shorter time to use automatic toll collection lanes than manual toll collection lanes at the CHT, increasing the number of automatic toll collection lanes at the CHT may not allow more vehicles to use the tunnel simultaneously or further improve the traffic flow.

The proposal of converting some manual toll collection lanes at the CHT to automatic toll collection lanes during peak hours involves changing the payment mode at certain toll collection lanes at different time periods of a day. This will result in longer waiting time for motorists using manual toll collection lanes. In addition, due to the need to display corresponding road signs and traffic signs at the tunnel area and approach roads to direct motorists to the automatic toll collection lanes, if some manual toll collection lanes are converted to automatic ones or the relevant road signs and traffic signs are changed during peak hours only, motorists may be easily confused resulting in traffic chaos and potential safety risks. Given the above reasons, we are of the view that the proposal may not be able to ease the traffic congestion at the CHT, and has its drawbacks.

Nonetheless, in order to improve the traffic situation at both exits of the CHT, the Government and the tunnel management company have been taking various traffic control measures, such as closing some of the manual toll collection lanes in the Hong Kong Island-bound direction intermittently during peak hours to alleviate the traffic flow at the automatic toll collection lanes, and to ensure a smooth traffic flow as a whole. Such arrangements not only can improve the traffic flow at the automatic toll collection lanes but also retain certain flexibility to enable tunnel users to freely choose their means to pay tolls. We will closely monitor the traffic situation at the CHT and review the current arrangements from time to time for making appropriate adjustments when necessary.

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