

# 立法會

## *Legislative Council*

LC Paper No. CB(4)619/20-21(06)

Ref. : CB4/PL/TP

### **Panel on Transport Meeting on 19 March 2021**

### **Updated background brief on replacement of traffic control and surveillance systems in government tunnels**

#### **Purpose**

This paper provides updated information on the replacement of the traffic control and surveillance systems ("TCSSs") in government tunnels and the Tsing Ma Control Area ("TMCA"). It also summarizes the major discussions by Legislative Council ("LegCo") Members on financial proposals on the replacement of TCSSs in the past.

#### **Background**

##### Traffic control and surveillance systems

2. Since early 1980's, all road tunnels and TMCA have been equipped with comprehensive traffic control and surveillance facilities including closed circuit television ("CCTV") cameras, automatic incident detectors, lane control signals ("LCS"), variable speed limit signs ("VSLS") and variable message signs, etc. for efficient and effective traffic and incident management.

3. Based on the information available on the website of the Transport Department ("TD"),<sup>1</sup> TCSSs have been expanded in recent years to include Shenzhen Western Corridor, Tolo Highway, Tsing Sha Control Area, Tuen Mun Road, Hong Kong-Zhuhai-Macau Bridge, Central Wanchai Bypass, Heung Yuen Wai Highway and Tuen Mun-Chek Lap Kok Link. New TCSSs are now being or will be implemented as part of the highway projects including the widening of Tai Po Road (Sha Tin Section), widening of Fanling Highway, Tseung Kwan O – Lam Tin Tunnel, Cross Bay Link (Tseung Kwan O), Central

---

<sup>1</sup> The relevant website of TD:

[https://www.td.gov.hk/en/transport\\_in\\_hong\\_kong/its/its\\_achievements/traffic\\_control\\_and\\_surveillance\\_systems/index.html](https://www.td.gov.hk/en/transport_in_hong_kong/its/its_achievements/traffic_control_and_surveillance_systems/index.html) [Accessed March 2021].

Kowloon Route and Trunk Road T2.

Lane control signals and variable speed limit signs of traffic control and surveillance system

4. According to the Administration,<sup>2</sup> TCSS consists of a number of sub-systems. LCS and VSLS are two key components of the field traffic equipment of a TCSS to manage traffic on expressways, control areas or tunnels. LCS provided real-time indication of lane status (e.g. whether the lane was in operation or closed) of the road and control traffic for guiding motorists to use the suitable lanes. VSLS regulated the speed of vehicles by indicating the speed limit applicable to a road section, which would be varied according to changes in traffic conditions. Effective functioning of LCS and VSLS was critical to the safety and management of expressways, control areas and tunnels.

**Major discussions by Members**

5. The major discussions by Members on funding proposals in relation to the replacement of TCSSs in government tunnels and TMCA in the past are summarized in the ensuing paragraphs.

Replacement of traffic control and surveillance systems

6. Members were briefed by the Administration on its funding proposals to replace TCSSs in the Kai Tak Tunnel ("KTT") and the Eastern Harbour Crossing ("EHC"), TMCA, as well as the Aberdeen Tunnel ("ABT") and the Tate's Cairn Tunnel ("TCT") at the meetings of the Panel on Transport ("the Panel") held in April 2016, July 2017 and March 2019.

7. When considering the above proposals, members generally noted and agreed that as the existing TCSSs which had been in service for a long time was ageing and the risk of malfunctioning would hence increase, they should be replaced to ensure the reliability, effectiveness and efficiency of the traffic control and surveillance of the tunnels. In addition, the components of the old systems had generally become obsolete, making the maintenance of the systems difficult and not economical.

8. Noting the long implementation time required for replacing TCSSs in KTT and EHC, members of the Panel in 2016 urged the Administration to

---

<sup>2</sup> LC Paper Nos. CB(4)618/18-19(03) and CB(1)1935/11-12(01)

expedite the works progress so as to minimize the impact of the installation work on normal tunnel operations. In reply, the Administration said that the proposed programmes of the replacement projects involved a series of works inside the tunnel tubes and roads in the tunnel area, such as site investigation, temporary traffic arrangement, system installation work, etc. Further, these works could only be carried out during non-peak hours. As such, the proposed implementation schedules were already very tight.

9. At the Panel meeting in July 2017, members noted that the estimated annual recurrent expenditure of the new TCSS in TMCA would be similar to that of the existing system, i.e. around \$11.1 million. They considered the amount quite high and asked if the annual recurrent expenditure had already covered the maintenance costs. Some members also expressed concern about the details of defects liability period ("DLP") of the new TCSS.

10. The Administration advised that the duration of DLP for general electrical and mechanical system was normally one year. During the one-year DLP, no fees would be charged for rectifying defects, while the operator would have to negotiate with the TCSS supplier on the maintenance charges thereafter. After the expiry of DLP, the operator of TMCA would be responsible for the repair and maintenance of the new system, including the replacement of defective spare parts when necessary. The relevant costs incurred would be covered under the overall management fee payable to the operator of TMCA.

11. During discussion on the funding proposal in 2019 on replacement of TCSSs in ABT and TCT, members expressed concern about the coverage of the new traffic surveillance systems within and outside the tunnel tubes, in particular if there were any blind spots within the tunnel areas that were not covered by CCTV.

12. The Administration advised that the new TCSS to be installed, consisting of CCTV system, automatic incident detection ("AID") system, etc., would be capable of facilitating the tunnel staff to detect traffic incidents happened within the tunnel area. The new AID system would use image processing techniques to detect vehicles which had stopped inside the tunnel tube due to traffic incidents and alert the control room correspondingly. It could also enhance the capability in identifying prevailing traffic situations (e.g. smoke detection inside the tunnel tube). The Administration would discuss with the operators of ABT and TCT the location, number and direction of cameras to be erected under the new TCSSs having regard to road conditions to ensure that the entire tunnel area would be covered.

13. On members' concern about the serviceable life of the new TCSSs, the Administration advised that the serviceable life of a new TCSS generally ranged from 12 to 15 years. The Electrical and Mechanical Services Department, together with TD, would review the operation and functions of different systems and equipment in government tunnels on an annual basis so as to ensure timely replacement of major tunnel systems.

14. At the Finance Committee ("FC") meeting in July 2020, members were concerned about the functionality of the digital cameras and monitors used under the new TCSSs in ABT and TCT. The Administration advised that the cameras would only capture images of the rear part of vehicles but not the front part (which might include images of the drivers/passengers) as the headlights would interfere with the visibility of the images, thereby affecting control room staff and potentially hindering their timely detection of incidents and response. The footages, which were password-protected and retained for a period of 21 days, were available for inspection by authorized persons only.

15. A member enquired at the same FC meeting that whether the TCSS and related systems were connected to government departments such as Hong Kong Police Force, and if the video records generated by the TCSSs concerned would be provided to Hong Kong Police Force on request. The Administration advised that the systems in question were standalone systems managed by the tunnel operators for monitoring traffic in tunnel areas and taking timely actions where necessary. Furthermore, the video records would primarily be used for monitoring of the traffic flow within tunnel areas. Under special circumstances, TD might provide relevant records kept under the TCSS to the government departments concerned for traffic-related investigation or prosecution purposes.

#### Replacement of the sub-systems of traffic control and surveillance system

16. In May 2012, members of the Panel were informed of the Administration's proposal to replace LCS and VSLS of TCSS in TMCA at an estimated cost of \$56.750 million. Being installed in TMCA since its commissioning in 1997, LCS and VSLS which had been in service for more than 14 years were then approaching the end of their economic serviceable life. The old fibre optic type LCS and VSLS were replaced with new Light Emitting Diode ("LED") type LCS and VSLS, which have wider viewing angle and are much brighter. LED displays were also considered more environmentally friendly, more reliable and having a longer service life. The relevant funding proposal was considered and approved at the meeting of FC on 13 July 2012.

17. In March 2019, members of the Panel were briefed by the Administration on its funding proposal to replace LCS and variable aspect signs

of TCSS in the Tseung Kwan O Tunnel ("TKOT"). Variable aspect signs of TCSS in TKOT included VLS and "tunnel closed" signs. A member considered that the new LCS and variable aspect signs of TCSS to be installed in TKOT should provide real-time traffic information within the tunnel area to motorists. In response to the member's further enquiry on the dissemination of traffic information in case of traffic accidents, the Administration advised that the tunnel operator concerned was required to inform the Emergency Transport Coordination Centre under TD in case of a traffic accident so that members of the public would be informed of the accident through media or smartphone applications. The incident information would also be disseminated to drivers by radio broadcast inside the tunnel and displayed on the relevant traffic signs. The franchise bus companies concerned would also be informed if certain bus routes needed to be re-routed.

### **Latest development**

18. The Administration plans to seek members' support for the funding application for taking forward the replacement of TCSSs at the Lion Rock Tunnel at the meeting of the Panel to be held on 19 March 2021.

### **Relevant papers**

19. A list of relevant papers is in the **Appendix**.

## List of relevant papers

Date of meeting	Meeting	Minutes/Paper	LC Paper No.
--	Panel on Transport	Administration's paper on replacement of field traffic equipment (lane control signals and variable speed limit signs) of traffic control and surveillance system in the Tsing Ma Control Area	CB(1)1935/11-12(01)  <a href="http://www.legco.gov.hk/yr11-12/english/panels/tp/papers/tpcb1-1935-1-e.pdf">http://www.legco.gov.hk/yr11-12/english/panels/tp/papers/tpcb1-1935-1-e.pdf</a>
13.7.2012	Finance Committee	Administration's paper on replacement of the lane control signals and variable speed limit signs of the traffic control and surveillance system in the Tsing Ma Control Area	FCR(2012-13)45  <a href="http://www.legco.gov.hk/yr11-12/english/fc/fc/papers/f12-45e.pdf">http://www.legco.gov.hk/yr11-12/english/fc/fc/papers/f12-45e.pdf</a>
		Minutes of meeting	FC193/11-12  <a href="http://www.legco.gov.hk/yr11-12/english/fc/fc/minutes/fc20120713.pdf">http://www.legco.gov.hk/yr11-12/english/fc/fc/minutes/fc20120713.pdf</a>
15.4.2016	Panel on Transport	Administration's paper on replacement of fire alarm system and manual toll collection system in the Aberdeen Tunnel, and traffic and control surveillance systems in the Eastern Harbour Crossing and the Kai Tak Tunnel	CB(4)831/15-16(07)  <a href="http://www.legco.gov.hk/yr15-16/english/panels/tp/papers/tp20160415cb4-831-7-e.pdf">http://www.legco.gov.hk/yr15-16/english/panels/tp/papers/tp20160415cb4-831-7-e.pdf</a>
		Minutes of meeting	CB(4)1321/15-16  <a href="http://www.legco.gov.hk/yr15-16/english/panels/tp/minutes/tp20160415.pdf">http://www.legco.gov.hk/yr15-16/english/panels/tp/minutes/tp20160415.pdf</a>

Date of meeting	Meeting	Minutes/Paper	LC Paper No.
3.6.2016	Finance Committee	Administration's paper on replacement of fire alarm system in the Aberdeen Tunnel; replacement of manual toll collection system in the Aberdeen Tunnel; replacement of traffic control and surveillance system in the Eastern Harbour Crossing; replacement of traffic control and surveillance system in the Kai Tak Tunnel; and replacement of Tunnel Lighting System in the Kai Tak Tunnel	FCR(2016-17)32  <a href="http://www.legco.gov.hk/yr15-16/english/fc/fc/papers/f16-32e.pdf">http://www.legco.gov.hk/yr15-16/english/fc/fc/papers/f16-32e.pdf</a>
		Minutes of meeting	FC314/15-16  <a href="http://www.legco.gov.hk/yr15-16/english/fc/fc/minutes/fc20160603.pdf">http://www.legco.gov.hk/yr15-16/english/fc/fc/minutes/fc20160603.pdf</a>
21.7.2017	Panel on Transport	Administration's paper on replacement of traffic control and surveillance system in Tsing Ma Control Area	CB(4)1409/16-17(03)  <a href="https://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20170721cb4-1409-3-e.pdf">https://www.legco.gov.hk/yr16-17/english/panels/tp/papers/tp20170721cb4-1409-3-e.pdf</a>
		Minutes of meeting	CB(4)1618 /16-17  <a href="https://www.legco.gov.hk/yr16-17/english/panels/tp/minutes/tp20170721.pdf">https://www.legco.gov.hk/yr16-17/english/panels/tp/minutes/tp20170721.pdf</a>
23.2.2018	Finance Committee	Administration's paper on replacement of traffic control and surveillance system in the Tsing Ma Control Area	FCR(2017-18)59  <a href="https://www.legco.gov.hk/yr17-18/english/fc/fc/papers/f17-59e.pdf">https://www.legco.gov.hk/yr17-18/english/fc/fc/papers/f17-59e.pdf</a>

Date of meeting	Meeting	Minutes/Paper	LC Paper No.
		Information provided by the Administration on follow-up issues in respect of FCR(2017-18)59 related to the replacement of traffic control and surveillance system in the Tsing Ma Control Area (follow-up paper)	FC259/17-18(01) <a href="https://www.legco.gov.hk/yr17-18/english/fc/fc/papers/fc20180223fc-259-1-e.pdf">https://www.legco.gov.hk/yr17-18/english/fc/fc/papers/fc20180223fc-259-1-e.pdf</a>
		Minutes of meeting	FC21/18-19 <a href="https://www.legco.gov.hk/yr17-18/english/fc/fc/minutes/fc20180223.pdf">https://www.legco.gov.hk/yr17-18/english/fc/fc/minutes/fc20180223.pdf</a>
15.3.2019	Panel on Transport	Administration's paper on replacement of traffic control and surveillance systems and other equipment in government tunnels	CB(4)618/18-19(03) <a href="https://www.legco.gov.hk/yr18-19/english/panels/tp/papers/tp20190315cb4-618-3-e.pdf">https://www.legco.gov.hk/yr18-19/english/panels/tp/papers/tp20190315cb4-618-3-e.pdf</a>
		Administration's supplementary information on replacement of traffic control and surveillance systems and other equipment in government tunnels (follow-up paper)	CB(4)1216/18-19(01) <a href="https://www.legco.gov.hk/yr18-19/english/panels/tp/papers/tp20190315cb4-1216-1-e.pdf">https://www.legco.gov.hk/yr18-19/english/panels/tp/papers/tp20190315cb4-1216-1-e.pdf</a>
		Minutes of meeting	CB(4)1218/18-19 <a href="https://www.legco.gov.hk/yr18-19/english/panels/tp/minutes/tp20190315.pdf">https://www.legco.gov.hk/yr18-19/english/panels/tp/minutes/tp20190315.pdf</a>



Date of meeting	Meeting	Minutes/Paper	LC Paper No.
3.7.2020	Finance Committee	<p>Administration's paper on (a) A new commitment of \$108,600,000 for the replacement of Traffic Control and Surveillance System and Radio Communication System in the Aberdeen Tunnel; (b) a new commitment of \$184,470,000 for the replacement of Traffic Control and Surveillance System in the Tate's Cairn Tunnel; (c) a new commitment of \$10,253,000 for the replacement of Lane Control Signals and Variable Aspect Signs of Traffic Control and Surveillance System in the Tseung Kwan O Tunnel; and (d) a new commitment of \$13,900,000 for the replacement of Private Automatic Branch Exchange Systems in the Eastern Harbour Crossing, Lion Rock Tunnel, Shing Mun Tunnels and Cross-Harbour Tunnel</p>	<p>FCR(2020-21)25</p> <p><a href="https://www.legco.gov.hk/yr19-20/english/fc/fc/papers/f20-25e.pdf">https://www.legco.gov.hk/yr19-20/english/fc/fc/papers/f20-25e.pdf</a></p>
		<p>Information provided by the Administration on follow-up issues in respect of FCR(2020-21)25 related to the replacement of traffic control and surveillance systems, lane control signals and variable aspect signs of traffic control and surveillance system and</p>	<p>FC252/19-20(01)</p> <p><a href="https://www.legco.gov.hk/yr19-20/english/fc/fc/papers/fc20200703fc-252-1-e.pdf">https://www.legco.gov.hk/yr19-20/english/fc/fc/papers/fc20200703fc-252-1-e.pdf</a></p>

<b>Date of meeting</b>	<b>Meeting</b>	<b>Minutes/Paper</b>	<b>LC Paper No.</b>
		private automatic branch exchange systems in government tunnels	
		Minutes of meeting	FC53/20-21  <a href="https://www.legco.gov.hk/yr19-20/english/fc/fc/minutes/fc20200703.pdf">https://www.legco.gov.hk/yr19-20/english/fc/fc/minutes/fc20200703.pdf</a>

Council Business Division 4  
Legislative Council Secretariat  
12 March 2021