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By Email

Ms Sophie LAU
Clerk to Panel on Transport
Legislative Council Secretariat
Legislative Council Complex
1 Legislative Council Road
Central, Hong Kong

27 May 2021

Dear Ms LAU,

Legislative Council Panel on Transport

Meeting on 19 March 2021

**Replacement of Traffic Control and Surveillance System
at the Lion Rock Tunnel**

In response to the Panel's request at the meeting on 19 March 2021, we provide supplementary information on the details of the proposed replacement of the traffic control and surveillance system ("TCSS") of the Lion Rock Tunnel ("LRT").

Current situation of TCSS

Statistics on faults

2. Over the past four years, the existing TCSS of LRT (including central control system, traffic control system and traffic surveillance system) had 77 faults due to defective components, and another 64 faults mainly owing to minor breakdown in the communication between the central control system and other sub-systems on average in a year. Details are tabulated below -

Year	Number of faults [Number of faults due to defective components]			
	Central control system ¹	Traffic control system ²	Traffic surveillance system ²	Total
2017	8 [6]	63 [22]	86 [56]	157 [84]
2018	12 [5]	68 [35]	24 [16]	104 [56]
2019	11 [2]	59 [30]	75 [44]	145 [76]
2020	12 [5]	76 [41]	70 [46]	158 [92]
Total	43 [18]	266 [128]	255 [162]	564 [308]

Coverage of Closed Circuit Television ("CCTV") system

3. The existing CCTV system of LRT is installed with 44 cameras (30 of them

¹ When the relevant fault occurred, although some of its computer equipment was affected and suspended operation temporarily, the central control system could maintain normal operation and control other sub-systems and equipment.

² When the relevant fault occurred, only the individual field equipment of the sub-system was affected, but the central control system could maintain normal operation and control other equipment.

inside the tunnel tubes and 14 in the open road sections connecting to the tunnel), covering the majority of the tunnel area (except for certain locations on the approach roads to the tunnel). Although certain locations on the approach roads are not covered by the existing CCTV system, the tunnel operator is required to patrol the whole tunnel area (including the aforementioned locations) regularly for better traffic monitoring. In this TCSS replacement project, to enhance traffic monitoring and management efficiency, more digital cameras will be installed on the open sections of approach roads to the tunnel so as to provide full coverage.

Replacement Works of TCSS

Engagement of engineering consultants

4. According to the “Engineering & Associated Consultants Selection Board Handbook” issued by the Civil Engineering and Development Department, government departments may consider engaging engineering consultants to acquire specialist expertise knowledge not available in the department and to facilitate a multi-disciplinary approach. The project of replacing the TCSS of LRT involves multi-disciplinary aspects, such as traffic and transport, civil and structural engineering, etc. To ensure close coordination and effective integration among the relevant aspects, we consider it crucial to engage an engineering consultant with specialist expertise. The engineering consultant will be responsible for a wide range of tasks pertaining to multi-disciplinary aspects of the TCSS, including site investigation, design of system functions and performance requirements, review of site conditions and traffic plans, etc. The work of the consultants will serve as essential inputs for the Electrical and Mechanical Services Trading Fund (“EMSTF”) to take forward the replacement project, for instance the technical requirements to be specified in the tender documents. The consultants will also support EMSTF in the testing and commissioning of the new TCSS.

5. On the other hand, EMSTF will perform different tasks before, during and after the replacement works. EMSTF is responsible for carrying out feasibility study on different proposals; engaging and supervising the engineering consultants who will assist EMSTF in taking forward the replacement project; preparing tender documents covering system specifications, system design and

project programme; as well as tendering and selecting a contractor. Upon engagement of the contractor, EMSTF will, with the assistance of the engineering consultants, monitor the performance of the contractor and works progress, including supervising site inspection, installation, testing and commissioning of the system. After the replacement works are completed, EMSTF will be responsible for monitoring the operation of the system and the rectification work within the defects liability period (i.e. one year after the commissioning of the system).

Implementation plan

6. The proposed schedule of system replacement has taken into account the conditions of the existing structural and building services facilities as well as the road design of LRT. Reference has also been made to the time required for recent projects of replacement of TCSSs of Aberdeen Tunnel and Tate's Cairn Tunnel. As LRT is one of the major trunk roads connecting the New Territories and Kowloon, it adopts a "one-tube two-way" arrangement at seven nights every month to facilitate maintenance and repair (the tunnel tube is closed from around 1:30 am to 6:00 am) in order to minimise the impact on tunnel operation and traffic. A majority of the installation works for the replacement of TCSS of LRT can only be carried out when the tunnel tube is closed. Given the need to put in place safety protection measures (such as site fencing) before the installation works and to re-open the site afterwards, only a limited amount of works can be completed every night. With due regard to the aforesaid circumstances and with reference to past experience, the estimated required time for this TCSS replacement (i.e. 56 months) is on par with that for similar projects³.

7. Nevertheless, it is the common goal of government departments to complete the replacement works at the soonest possible. As EMSTF indicated at the meeting of 19 March 2021, tendering and selection of engineering consultants would be conducted in parallel with a view to expediting the replacement of TCSS. During the replacement, EMSTF will review the actual circumstances to see if it is feasible to compress the time required for certain tasks. The

³ For example, the estimated project duration for the replacement of TCSS of Aberdeen Tunnel, which started in August 2020, is 55 months; whereas that of Tate's Cairn Tunnel (which is approximately twice as long as LRT), which also started in August 2020, is expected to last for 60 months.

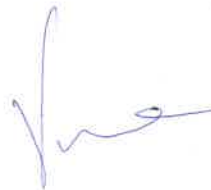
Transport Department (“TD”) will also proactively review if there is any room for adjusting the frequency of tunnel tube closure based on the tunnel traffic, in order to extend the period where works can be carried out.

TCSSs in Other Tunnels

8. Generally speaking, the plan for TCSS replacement will take into account the economical serviceable life (about 12-15 years in general with appropriate repair and maintenance). This notwithstanding, the actual serviceable life of TCSS of individual tunnels may vary due to a number of factors, such as traffic flow, pollutant emissions, ventilation facilities, weather conditions, supply of components, etc.

9. Funding has been secured from the Legislative Council in the past few years for the TCSS replacement projects for some government tunnels/control areas (including Kai Tak Tunnel, Eastern Harbour Crossing, Tsing Ma Control Area, Tate’s Cairn Tunnel and Aberdeen Tunnel) which will be completed in the next few years. We envisage that the TCSSs of Cross-Harbour Tunnel and Tseung Kwan O Tunnel will approach the end of their economical serviceable life in the coming years. TD and EMSTF will continue to assess the conditions of various tunnel systems regularly and apply for necessary funding in accordance with established procedures in order to ensure their timely replacement.

Yours sincerely,



(Ms Vivien LI)

For Secretary for Transport and Housing

c.c. Transport Department (Attn.: Mr Patrick WONG)
Electrical and Mechanical Services Department (Attn.: Mr KO Chi-chung)