For discussion
on 21 July 2017

Legislative Council on Transport

Replacement of Traffic Control and Surveillance System in the Tsing Ma Control Area

Purpose

This paper seeks Members' support for seeking funding approval from the Finance Committee ("FC") of the Legislative Council on the proposals to replace the traffic control and surveillance system ("TCSS") in the Tsing Ma Control Area ("TMCA").

Background

2. The TCSS in TMCA is for ensuring the safe and effective operation of the control area. The system is mainly used for supporting the monitoring and management of traffic. Facilities for traffic management include variable message signs and over-height vehicle detectors etc., while facilities for traffic monitoring include automatic incident detection system, closed circuit television ("CCTV") system and environmental monitoring system, etc.

Proposal

3. We propose to create a commitment of $298.91 million to replace the TCSS in TMCA.

Justification

4. The existing TCSS in TMCA has been in use for more than 20 years. It had already commenced operation when TMCA was commissioned in 1997. According to the Electrical and Mechanical Services Trading Fund ("EMSTF"), the TCSS has been operating for a long

time and is increasingly difficult and not cost effective to carry out repairs. For example, the existing multimode optical fibre cables[1] in the system can only provide limited bandwidth. They have long been replaced by single-mode optical fibre cables in the telecommunication industry. Other relevant equipment such as prismatic variable message signs, CCTV system and emergency telephone system are also beyond their economical serviceable life. Since most of the equipment and components of the system were aging and it is increasingly difficult to procure the required spare parts from the market for maintenance, EMSTF considers it necessary to replace the whole TCSS.

5. On the other hand, the risk of system malfunction has increased due to aging. If the system is not replaced in a timely manner, the frequency and seriousness of system failure may both increase. A breakdown of the TCSS may cause a malfunction of various traffic control and the surveillance equipment, hampering the traffic monitoring, control and direction in TMCA. It may also affect the detection of traffic accidents and the subsequent rescue and vehicle recovery operations. Since TMCA is a major expressway connecting Kowloon and Hong Kong Island to the western New Territories, Lantau Island and the Hong Kong International Airport, any traffic chaos and delay in the control area could have a significant impact on the traffic in the vicinity as well as in other areas, and may even affect the operations of the Airport.

6. The new TCSS in TMCA will be a fully computerised system which integrates various traffic control and monitoring functions on a single platform. It is also capable of implementing more programmed traffic management schemes for improving operation efficiency. The capability of the system in controlling remote traffic message signs, signals and other field equipment will be enhanced to meet traffic management needs. The system will also have high definition cameras and monitors for providing clearer images for more effective traffic monitoring. Furthermore, more cameras will be erected on the approach roads to enhance traffic monitoring and management efficiency.

---

[1] Single-mode optical fibre enables a higher transmission rate and longer transmission distance compared to multimode optical fibre, enhancing the performance of TCSS.

Financial Implications

Non-recurrent Expenditure

7. We estimate that the total non-recurrent expenditure for the replacement of the TCSS in TMCA is $298.91 million. The breakdown is as follows –

			$'000
(a)	Replacement of the TCSS in TMCA		241,100
	(i) Central Control System	59,870	
	(ii) Traffic Surveillance System	36,000	
	(iii) Traffic Control System	28,100	
	(iv) Communication System and network	53,630	
	(v) Associated civil engineering and building service work, cables and accessories	63,500	
(b)	EMSTF project management charges		33,700
(c)	Contingency (10% of item (a) above)		24,110
	Total		**298,910**

8. Regarding item (a) of paragraph 7 above, the estimated expenditure of $241.1 million is for the supply and installation of the new TCSS, including the central control system, CCTV system, automatic incident detection system, remote-controlled traffic signs, variable message signs, various field equipment (e.g. over-height vehicle detectors), computer hardware and software, data communication network and the associated cables and accessories; building services works for traffic control room and replacement works for associated control facilities, together with the dismantling and removal of old equipment; and the removal and reinstatement of tunnel wall panels.

9. Regarding item (b) of paragraph 7 above, the estimated expenditure of $33.7 million is for meeting the charges of EMSTF for managing the project, which includes preparing the system specifications, designing and overseeing the tendering process of the TCSS and engaging civil and traffic engineering consultants; supervising site inspection, installation, testing and commissioning of the system; and monitoring the operation of the system facilities and rectification work within the defects liability period.

10. Regarding item (c) of paragraph 7 above, the estimated cost of $24.11 million is for contingency use, which is 10% of item (a) of paragraph 7 above.

11. The estimated cash flow is as follows –

Year	**$'000**
2017-18	6,000
2018-19	12,000
2019-20	43,000
2020-21	60,000
2021-22	79,000
2022-23	98,910
Total	**298,910**

Recurrent Expenditure

12. The annual recurrent expenditure of the above system takes up around $11.1 million of the overall management fee payable to the operator of TMCA. The recurrent expenditure should be similar to that for the existing system. No additional recurrent expenditure will be incurred by the replacement of the system.

13. According to the existing policy, the operating cost of government tolled roads should be recovered through toll charges. Since the depreciation costs of the proposal are part of the operating costs of tolled road, it will be taken into account when setting the relevant toll charges in future.

Implementation Plan

14. If funding is approved by FC in the fourth quarter of 2017, we plan to proceed with the replacement project in the following timetable –

	Work	Target Completion Date
(a)	Site investigation and tender preparation	Q4 of 2018
(b)	Tendering exercise and selection of contractor	Q3 of 2019
(c)	System design by contractor	Q2 of 2020
(d)	Procurement and installation of associated equipment	Q1 of 2022
(e)	Testing and training	Q3 of 2022
(f)	Commissioning and changeover of system	Q3 of 2022

15. During the implementation of the project, we will minimise the impact on traffic as far as possible. All the installation work will be arranged to be carried out during non-peak hours such that the normal operations of TMCA will not be affected.

Way Forward

16. We plan to seek FC's funding approval as early as practicable with a view to commencing the relevant works as soon as possible.

Advice Sought

17. Members are invited to provide comments and support the proposal.

Transport and Housing Bureau
July 2017