

**For discussion**  
**24 February 2006**

## **Legislative Council Panel on Transport**

### **Replacement of the Field Equipment of the Toll Collection Systems in the Tseung Kwan O Tunnel, Shing Mun Tunnels and Lion Rock Tunnel**

#### **PURPOSE**

This paper seeks Members' views on the proposal to replace the field equipment of the toll collection systems for the manual toll lanes at Tseung Kwan O Tunnel (TKOT), Shing Mun Tunnels (SMT) and Lion Rock Tunnel (LRT)<sup>1</sup>.

#### **BACKGROUND**

2. The field equipment of the toll collection systems (including traffic control equipment, vehicle detection equipment, vehicle classification equipment and toll booth equipment) at SMT and TKOT was installed in 1990, and that at LRT was installed in 1991. The equipment is under the control of the toll lane processors which feed the toll registration details to the toll central computer system for real-time monitoring and generation of toll collection reports.

#### **PROPOSAL**

3. We propose to replace the field equipment of the toll collection systems at TKOT at a cost of \$16.4 million, SMT at a cost of 18.8 million, and LRT at a cost of 18.8 million. The total cost will be \$54 million.

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<sup>1</sup> The toll field equipment for the autotoll lanes at TKOT, SMT and LRT is not covered by the proposed replacement project in question.

## **JUSTIFICATION**

4. The field equipment of the toll collection systems has been in operation for 15 years. According to the Director of Electrical and Mechanical Services, most components of the equipment are reaching the end of their serviceable life and are beyond economical repair. The equipment is now showing definite signs of aging with reducing reliability. Moreover, it has become increasingly difficult to maintain the aged equipment and to procure the spare parts in the market as they have become obsolete. Any delay in replacing the equipment could lead to complete system failures, which would seriously affect the efficiency of toll collection and traffic throughput, causing congestion in the tunnels and in their vicinity.

5. In view of the above-mentioned maintenance problems and the long lead time for tendering, delivery, installation and commissioning works, we consider that it is necessary to start the replacement project for these three tunnels as soon as possible.

6. The new field equipment will adopt the most advanced technologies to minimize equipment downtime and avoid unexpected toll lane closures. Detailed real-time equipment status and toll registration information will be indicated at the toll supervisor control console in the control rooms of the tunnels so that any irregularities at the toll booths could be detected and remedial actions taken immediately. The storage capacity of the toll lane processors will also be enlarged to provide data backup in case the central toll computer system breaks down. The overall design will emphasize high data security, high operational efficiency and minimum maintenance.

## **FINANCIAL IMPLICATIONS**

7. We estimate that a non-recurrent expenditure of \$54 million (\$16.4 million for TKOT, \$18.8 million for SMT, and \$18.8 million for LRT) will be required for the replacement of the field equipment of the toll collection systems in the three tunnels. The breakdown is as follows:

Description	Estimated Cost (HK\$M)		
	TKOT <sup>2</sup>	SMT <sup>3</sup>	LRT <sup>4</sup>
(a) Replacement of the toll booth equipment for all manual toll lanes	6.3	7.2	7.2
(b) Replacement of the toll lane equipment for all manual toll lanes	4.5	5.2	5.2
(c) Replacement of other ancillary toll collection field equipment and central toll computer system	2.4	2.7	2.7
(d) Electrical and Mechanical Services Trading Fund (EMSTF) project management charges	1.9	2.2	2.2
(e) Contingency (10% of (a) to (c))	1.3	1.5	1.5
Total:	<u>16.4</u>	<u>18.8</u>	<u>18.8</u>

8. On paragraph 7(a) above, the cost is for the design, supply, installation, testing and commissioning of the toll booth equipment, including the toll lane processors for the control and monitoring of all field equipment, the toll collector terminal, the card readers for access control, intercoms, emergency foot-operated alarm, security switches and beacons, and the necessary interfacing devices with the Autotoll System.

9. On paragraph 7(b) above, the cost is for the design, supply, installation, testing and commissioning of the toll lane equipment, including the toll lane status signals, the manual barriers, the classification signs, vehicle detectors and axle counters, the toll paid signs and traffic lights.

<sup>2</sup> There are 8 manual toll lanes at TKOT.

<sup>3</sup> There are 9 manual toll lanes at SMT.

<sup>4</sup> There are 9 manual toll lanes at LRT.

10. As regards paragraph 7(c) above, the cost is for the design, supply, installation, testing and commissioning of other ancillary toll collection field equipment and the central toll computer system. These include the toll supervisor console, the communication networks between the toll lane processors and the central toll computer, and the uninterruptible power supply for the toll collection system.

11. As regards paragraph 7(d) above, the cost is for the engineering consultancy services provided by EMSTF, who will undertake the whole project including technical studies, definition of requirements, preparation of project programme and estimates, design, tendering, site inspection, installation supervision, testing and commissioning of the systems, as well as monitoring of defect rectification during the defect liability period.

12. We intend to phase the expenditure as follows:

Financial Year	Cash Flow (HK\$M)		
	TKOT	SMT	LRT
2006/2007	1.7	1.9	1.9
2007/2008	6.5	7.5	7.5
2008/2009	8.2	9.4	9.4
Total	<u>16.4</u>	<u>18.8</u>	<u>18.8</u>

13. There will not be additional recurrent expenditure. The operation and maintenance of the systems will be borne by the respective tunnel management contractors and there will be no impact on the toll charges of the tunnels.

## **IMPLEMENTATION PLAN**

14. We plan to start the replacement project for the three tunnels in late August 2006. The replacement works at the three tunnels will be implemented simultaneously, and will take 27 months to complete. The first nine months are for preparatory works including detailed investigation, system design and preparation of specifications and tendering. The latter 18 months are for equipment manufacturing and delivery, system installation, testing and commissioning. The project is expected to be completed before the end of November 2008. The work programme is at the **Annex**.

15. During the implementation of the project, we will ensure minimal disruption to the tunnel traffic as far as possible. All the installation works will be arranged during non-peak hours or the tunnel closure period in the early hours such that the normal operation of the tunnels will not be affected. To avoid disruption of the traffic flow through the tunnels during the replacement period, we shall replace the equipment lane by lane and divert traffic to the lanes in operation.

## **THE WAY FORWARD**

16. We will seek the approval of the Finance Committee on 7 April 2006 for funding the replacement of the field equipment of the toll collection systems concerned.

## **ADVICE SOUGHT**

17. Members are invited to comment on the proposal.

Environment, Transport and Works Bureau  
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**Annex**

**Work Programme for the Replacement of the Field Equipment of Toll Collection Systems  
in the Tseung Kwan O Tunnel, Shing Mun Tunnels and Lion Rock Tunnel**

	Task Name	Duration (months)	2006				2007				2008					
			1-6		7-12		1-6		7-12		1-6		7-12			
1	System Engineering Study	3				■										
2	Detailed Design	3						■								
3	Tendering	3							■							
4	Equipment Manufacturing, Installation, Testing & Commissioning	18									■	■	■	■	■	■