

## **Legislative Council Panel on Transport**

### **Replacement of Tunnel Lighting System in the Cross-Harbour Tunnel**

#### **PURPOSE**

This paper seeks Members' views on the proposal to replace the lighting system in the Cross-Harbour Tunnel (CHT).

#### **BACKGROUND**

2. The existing lighting system in the CHT comprises a power supply system, a centralised control and monitoring system, lighting luminaires, cabling and other associated equipment. The lighting system was installed when the tunnel was commissioned in 1972. Many core components of the system are reaching the end of their serviceable life. It is necessary to replace the whole system to ensure safe, efficient and cost-effective tunnel operation.

#### **PROPOSAL**

3. We propose to replace the existing lighting system of the CHT at an estimated cost of \$51.4 million.

#### **JUSTIFICATION**

4. The existing tunnel lighting system was put in use when the CHT was opened in 1972. Most of the core components of the tunnel lighting system have reached the end of their serviceable life. In addition, the spare parts are mostly old designs and have become obsolete, and it is increasingly difficult to procure them.

5. The light casings of the tunnel luminaires have also been seriously corroded and contaminated by humidity and exhaust gas from vehicles. The luminaires are no longer dust-proof and water-proof because of corrosion. The dust accumulated on the light casings affects the illumination in the tunnel. Intensive cleansing of the light casings is required to maintain an acceptable level of illumination. However, given the heavy traffic flow of the CHT, closure of one tunnel tube for

maintenance is only possible in the middle of the night from 1:30 a.m. to 5:30 a.m. The limited time makes it extremely difficult to carry out the cleansing task.

6. As the tunnel lighting system is a critical system in the operation of the tunnel, we consider that it should be replaced. If the service of the CHT has to be suspended due to tunnel lighting failure, there will be serious traffic congestion on the roads linking Hong Kong Island and Kowloon. To avoid such problems and taking into account the long lead time for tendering, delivery, installation and commissioning works, we consider it necessary to start the replacement project as early as possible.

7. For efficient tunnel operation and the safety of tunnel users, we propose to procure a new lighting system with an uninterruptible power supply system and emergency generators to provide more reliable power supply for tunnel lighting. Higher quality fluorescent tubes will be used in each luminaire for better and more cost-effective illumination. The latest design requirements stipulated by the Transport Department and Highways Department and international standards will be adopted.

## **IMPLEMENTATION PROGRAMME**

8. We plan to start the replacement project in mid-2004, which will take about 27 months to complete. A work programme is at the **Annex**. The first nine months are for preparatory works including detailed investigation, system design, preparation of specifications and tendering. The latter 18 months are for equipment order and delivery, system installation, testing and commissioning.

9. During implementation of the project, we will ensure minimal disruption to the tunnel traffic as far as possible. For equipment installation and testing within the tunnel tubes, works will only be carried out at night during the routine tube closure for maintenance, with the other tunnel tube adopting the one-tube-two-way mode. During the tube closure period, appropriate traffic aids will be put up and radio broadcast will be made inside the tunnel to alert motorists of the arrangement.

## FINANCIAL IMPLICATIONS

10. We estimate that the capital cost of the project would be \$51.4 million, with the breakdown as follows -

		<b>\$ million</b>
(a)	Replacement of	36.7
	(i) lighting fittings inside tunnel tubes	28
	(ii) power supply and control equipment inside tunnel recesses	2
	(iii) tunnel lighting console in control room	1.2
	(iv) cables	5.5
(b)	Improvement to essential power supply system	5.5
(c)	Electrical and Mechanical Services Trading Fund project management charges	5.0
(d)	Contingency (10% of (a) and (b))	4.2
	<b>Total</b>	<u><u>51.4</u></u>

11. Regarding paragraphs 10(a) to (b), the total cost of \$42.2 million will cover the supply, installation, testing and commissioning of all luminaries, emergency generators, uninterruptible power supply, tunnel lighting console, control equipment for the tunnel lighting system as well as the associated electrical works such as cabling and wiring.

12. On paragraph 10(c), the Electrical and Mechanical Services Department will carry out the project's feasibility study, prepare the specifications, design and project programme, oversee the tendering process, and undertake site inspection, installation supervision, testing and commissioning of the system, as well as monitor defect rectification during the defect liability period.

13. We intend to phase the expenditure as follows -

<b>Year</b>	<b>\$ million</b>
2004-2005	2.0
2005-2006	21.0
2006-2007	26.0
2007-2008	2.4
<b>Total</b>	<b>51.4</b>

14. Since this is a replacement system, there will not be any additional recurrent expenditure.

15. The above proposal will have no impact on the level of the tolls of the CHT.

### **THE WAY FORWARD**

16. We will seek the approval of the Finance Committee on 30 April 2004 on funding for the replacement of the lighting system in the CHT.

### **ADVICE SOUGHT**

17. Members are invited to comment on the proposal.

**Work Programme for Replacement of Tunnel Lighting System in Cross-Harbour Tunnel**

	Task Name	Duration (months)	2004		2005		2006	
			1-6	7-12	1-6	7-12	1-6	7-12
1	System Engineering Study	4		■				
2	Detailed Design	4		■				
3	Tendering	3			■			
4	Installation, Testing & Commissioning	18			■	■	■	■