

Report No. 57 of the Director of Audit — Chapter 5

MAINTENANCE OF PUBLIC ROADS

Summary

1. The road network in Hong Kong is made up of about 2,070 kilometres (km) of public roads and 3,800 highway structures (such as road tunnels and flyovers). The Highways Department (HyD) is responsible for their maintenance. It lets out term contracts through competitive tendering for undertaking the maintenance works. The Audit Commission (Audit) has recently conducted a review of the HyD's maintenance of public roads including the highway structures.

Implementation of management and maintenance contract provisions

2. In 2004, the HyD introduced management and maintenance (M&M) provisions in one of its road maintenance contracts. The objective was to achieve efficiency and cost savings, through greater management input from the contractor in road inspection and subsequent arrangement of minor repair works. Up to April 2011, the HyD had let out 14 contracts with M&M provisions.

3. *Measuring and monitoring contractors' performance.* Payment for M&M works is performance-linked. HyD staff conduct Engineer's audits and inspections of the M&M works for measuring and monitoring the contractors' performance. Audit found that the HyD had not: (a) maintained records of sample selections; and (b) compiled statistics for monitoring the extent of check for Engineer's inspections. The HyD indicated that it would review the relevant guidelines. Audit also found that the HyD had not compiled statistics for monitoring the extent of supervisory checks for both Engineer's audits and inspections. *Audit has recommended that the Director of Highways should: (a) take urgent action to complete the reviews and issue new guidelines for conducting Engineer's inspections; (b) maintain adequate records of the sample selections carried out for Engineer's inspections; (c) monitor the compliance with the extent of Engineer's inspections as stipulated in the new guidelines; and (d) regularly compile statistics to monitor the extent of supervisory checks on Engineer's audits and inspections.*

4. ***Control over road marking works.*** In 2007, the HyD agreed to a contractor's proposal to omit the annual road marking renewal works for selected roads where the markings had been maintained to a satisfactory performance standard. However, the HyD did not immediately issue a variation order for the omitted works and demand a corresponding deduction in the contract payments. There was no record to show that specific approval had been sought for the omitted works in accordance with the Stores and Procurement Regulations. *Audit has recommended that the Director of Highways should: (a) strengthen controls to ensure that a variation order is issued as early as practicable for reducing the scope of any works items; (b) remind the relevant HyD staff to seek specific approval for the omission of works; and (c) expedite the recovery from the contractor concerned of the value of omitted works.*

5. ***Electronic Maintenance Management System (EMMS).*** As part of the M&M works, the contractors are required to establish and maintain an EMMS for planning and data storage of maintenance works. Audit found that: (a) in one contract, the physical completion date of establishing the EMMS as entered in the completion certificate was inaccurate; (b) the EMMSs of three contracts had been operating without the stipulated facilities to produce lists of outstanding defects for three to four years; (c) the outstanding defect lists of two contracts were not maintained up-to-date; and (d) the EMMSs of three contracts contained incomplete complaint statistics. *Audit has recommended that the Director of Highways should: (a) strengthen the control over the checking of the accuracy of the physical completion date in the completion certificate; (b) require the contractors concerned to promptly rectify the non-compliant problems; and (c) tighten the control over the contractors' compliance with the contract requirements in operating and maintaining the EMMS.*

6. ***Post-implementation review.*** As of April 2011, 6 of the 14 road maintenance contracts with M&M provisions had been completed. However, the HyD has not carried out a post-implementation review to draw lessons for continuous improvement. Audit also noted that the HyD had not compiled at the project planning stage baseline information for monitoring the expected staff savings to be achieved from incorporating M&M provisions in the contracts. *Audit has recommended that the Director of Highways should: (a) conduct a post-implementation review of the M&M contract arrangement; and (b) remind officers concerned to compile baseline information for monitoring the achievement of benefits expected from new contract arrangements in future.*

Inspection of highway structures

7. **General inspection.** Since 2006, the HyD has tightened the general inspection requirements such that close visual inspections (CVIs) should be conducted for certain structural parts of a highway structure. An under-bridge inspection plant (UBIP) was procured for conducting CVIs under a contract and for hiring to other contractors. Audit found that: (a) the UBIP was unfit for use in three bridges; (b) there was no contract provision requiring the use of the UBIP and the contractors could choose to use alternative access means depending on their costs; (c) there were cases of non-compliance with the contract requirement of seeking the HyD's approval of the selected locations for conducting CVIs; and (d) the HyD had not carried out any Engineer's inspection to monitor the contractors' performance in conducting CVIs. *Audit has recommended that the Director of Highways should: (a) check the specifications when procuring special equipment to ensure that they adequately cater for different site conditions; (b) consider specifying, in future contracts, those bridges for which a UBIP should be used for conducting CVIs; (c) closely monitor the contractors' compliance with the contract requirement of seeking approvals of selected locations for conducting CVIs; and (d) remind HyD staff to conduct adequate Engineer's inspections.*

8. **Special inspection.** Since April 2006, the HyD has required the contractors to carry out special inspections of highway structures under specified circumstances, such as after a water main burst. Audit found that in two water main burst incidents, the contractors concerned had not provided justifications for not conducting special inspections. The HyD had not used the information received from the Water Supplies Department for monitoring the contractors' follow-up actions. Besides, the distance between the triggering event of a special inspection and the affected highway structure was not clearly defined in the contract provisions. *Audit has recommended that the Director of Highways should: (a) closely monitor triggering events of special inspections to ensure that the relevant maintenance contractors carry out the inspections in accordance with the contract requirements; (b) introduce a mechanism for disseminating water main burst information received for monitoring the contractors' follow-up actions; and (c) review and revise the contract provisions concerning special inspections with a view to clearly specifying the circumstances under which special inspections should be conducted.*

9. **Principal inspection of road tunnels.** Since 2003, the HyD has laid down the requirement that principal inspections should be conducted to check the structural integrity of government tunnels 15 years after opening. Franchisees of the franchised tunnels would be advised to adopt the same requirement. Audit has found that: (a) there is room for improving the timeliness of principal inspections of government tunnels; and (b) there is a need to engage the management of the franchised tunnels well before the inspections are due to resolve issues that may arise. *Audit has recommended that the Director of Highways*

should: (a) take measures to improve the timeliness of principal inspections of government tunnels; and (b) remind the management of the two franchised tunnels (which will reach 15 years old in 2012 and 2013 respectively) to carry out principal inspections and engage them in discussion well before the inspections are due.

10. **Principal inspection of other highway structures.** In 2000, the HyD introduced a ten-yearly principal inspection requirement for highway structures (other than tunnels) of age over 25 years. According to the HyD, the requirement was withdrawn in 2004 after a review had found that such a requirement was over-conservative and resource-intensive. However, there was no documentation on the change in the inspection requirement. Moreover, it was not until March 2011 that a working group was formed to conduct a review and recommend a long-term strategy for principal inspections. *Audit has recommended that the Director of Highways should: (a) maintain adequate documentation to support the HyD's decisions on inspection requirements; and (b) expedite action on formulating a long-term strategy for conducting principal inspections of aged highway structures.*

Rehabilitation maintenance for roads

11. Rehabilitation maintenance is carried out to restore the serviceability and structural conditions of roads. Based on four road condition surveys conducted from 2002 to 2006, the HyD identified a total of 363 km lane length of roads requiring rehabilitation maintenance works. As of April 2011, the HyD had not completed actions on 31 km (8.5%) of these roads. Audit also noted errors in reporting the progress of these works. *Audit has recommended that the Director of Highways should: (a) expedite action on the outstanding rehabilitation maintenance works; and (b) remind the staff concerned to carry out validation checks on the accuracy of information contained in road maintenance management reports.*

Management of works orders

12. The HyD issues works orders to a contractor for carrying out road maintenance works. Within 90 days of completion of the works under a works order, the contractor is required to submit a dimension book of the works done. After checking the accuracy of the measurements in the dimension book, the HyD will make a final payment in order to finalise the works order. In 2008, the HyD's senior management expressed concern over the slow progress in finalising works orders for some completed contracts long after the expiry of their respective contract periods. As of March 2011, there were 909 works orders not yet finalised and 1,297 works orders with overdue dimension books. *Audit has recommended that the Director of Highways should: (a) explore more effective measures to expedite the finalisation of works orders; and (b) take measures to ensure the timely submission of dimension books by contractors.*

Performance reporting

13. *Performance indicator on road maintenance complaints.* The HyD has reported the number of complaints relating to road maintenance as one of its performance indicators in the Controlling Officer's Report (COR). However, the reported figures for 2008 to 2010 included only the complaints against engineering maintenance aspects of roads. *Audit has recommended that the Director of Highways should review the way of reporting complaint statistics in the COR with a view to reflecting all aspects of the HyD's maintenance work.*

14. *Performance reporting on principal inspections.* In the 2000-01 COR, the HyD included as part of the performance target on inspection of highway structures (other than tunnels) a new service of ten-yearly principal inspections on structures of age over 25 years. While the inspection requirement was withdrawn in 2004 (see para. 10), the HyD continued to report in the CORs for 2004-05 to 2011-12 the extent of achievement of the targeted inspections without providing explanatory notes about the change. *Audit has recommended that the Director of Highways should provide explanatory notes in the COR for changes in the reporting basis of performance measures.*

Response from the Administration

15. The Administration agrees with the audit recommendations.

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