立法會
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Panel on Transport

Meeting on 26 May 2014

Updated background brief on maintenance of road pavements in Hong Kong

Purpose

This paper provides updated background information on maintenance of road pavements in Hong Kong. It also summarizes the major views and concerns expressed by Legislative Council ("LegCo") Members during previous discussions on this subject.

Background

2. As at August 2013, Hong Kong's road network measures around 2 090 kilometres in total length[1]. According to the information provided by the Administration[2], depending on their characteristics, these roads are paved with either bituminous materials or concrete. Three-quarters of the roads in the territory are paved with bituminous materials and the remaining one-fourth are paved with concrete[3]. Generally speaking, the design life of bituminous pavement is 20 years and that of concrete pavement is 40 years. As continuous use will cause wear and tear of the roads[4], it is thus necessary to arrange various degrees of repair works.

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[1] Source: Hong Kong: The Facts (http://www.gov.hk/en/about/abouthk/factsheets/docs/highways.pdf)

[2] Source: The Administration's paper on "Highway Repair and Maintenance by Highways Department – Current Approach and Future Development" issued in January 2011 (LC Paper No. CB(1)1130/10-11(04))

[3] Previously, roads carrying a high volume of heavy vehicles were mostly paved with concrete, which is more durable than bituminous pavement. However, with advancing technology, the durability of bituminous materials has improved. And as the traffic impact caused by repair and maintenance works on bituminous pavement is less than those on concrete pavement, road surfaces are normally paved with bituminous materials nowadays.

[4] The major factor contributing to damage of road surfaces is wear and tear generated by travelling vehicles. If traffic throughput or vehicle weight (including overloading) exceeds the estimated figures determined in the design stage of a particular road section, the rate of wear and tear will also accelerate. Other factors contributing to damage of road surfaces include excessive braking, or leakages of engine oil or gas oil that corrode the bituminous pavement. On the other hand, flooding or accidents involving underground pipes may also cause damage to roads.

The rate of wear and tear is closely related to the usage rate of a road. In general, the road surface of most highways can remain in their best conditions for eight to ten years without the need to carry out major repair works.

Administration's policy

3. The Highways Department ("HyD") is responsible for the repair and maintenance of highways in Hong Kong. Its primary duty in highway maintenance is to rectify road defects, so that highways are always in their best condition for use by drivers. Highway repair and maintenance works can be divided into two types: corrective repairs and planned maintenance.

4. Corrective repairs focus on rectification of defects. After receiving reports of damaged road facilities from the public or identification of road defects during regular inspections, the defective road surface would be reinstated as soon as possible. Corrective repairs mainly include patching of pot holes, sealing of cracks on pavements, fixing damaged traffic signs and so on. According to HyD's performance pledge[5], the department will complete repairs within 48 hours upon receipt of reports of road defect.

5. Planned maintenance is in contrast preventive in nature, the priorities and programmes of which are determined on the basis of the design standard and current conditions of individual highway facilities, as well as the quality and durability of the materials employed. The aim of these maintenance works is to allow more comprehensive rehabilitation works bringing long lasting improvement. Maintenance works will be carried out after the facilities show signs of the wear and tear, but before serious defects emerge. Such works are usually of a larger scale and take more time to complete.

6. According to the Administration[6], different environmental friendly technologies are adopted in maintenance works as appropriate. These include waste reduction by adoption of concrete pavers made from recycled aggregates processed from construction and demolition materials or containing recycled glass; and reinstatement of localized defects on bituminous road pavement using in-situ bituminous material by thermal patcher which is able to reduce construction noise.

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[5] Source: http://www.hyd.gov.hk/en/about_us/performance_pledge/performance_pledge.pdf

[6] Source: http://www.hyd.gov.hk/en/district_and_maintenance/road/index.html

Road inspection

7. HyD has an established practice of conducting regular inspections on public road across the territory to identify, as early as possible, defects that pose dangers or cause inconvenience to the public and arrange for follow-up actions. The frequencies of these "safety inspections" mainly depend on road types: expressways carrying high-speed traffic and high traffic throughput are inspected daily; trunk roads and other primary distributor roads in urban areas are inspected weekly; other roads are inspected once every one to three months. In addition, HyD's road inspection teams also conduct "detailed inspection" for all road types once every six months to determine the surface and structural conditions of the roads and collect relevant data for planning mid- and long-term repair works so that maintenance could be done in an organized manner for preventive purpose.

Concerns of LegCo Members

8. In the fourth and fifth LegCo, Members at the Panel on Transport ("the Panel") meetings and the Council meetings expressed views on maintenance of road pavements in Hong Kong. Members' major concerns are summarized in the ensuing paragraphs.

Performance of HyD

9. On 28 January 2011, some members at the Panel meeting expressed concern over local complaints about road works conducted by HyD, which reportedly had disrupted traffic and caused delays and inconvenience to road users. Members therefore urged the Administration to better coordinate the road works, give greater consideration to drivers' needs and avoid conducting works during peak hours.

10. When examining the Estimates of Expenditure 2014-15 in 2014, a Finance Committee ("FC") Member raised a written question showing concern about the increase in complaints relating to road maintenance, which were raised from 7 992 cases in 2012 to 9 909 cases in 2013. Another FC Member asked a question about his worry that the increasingly serious problem of damages to many public roads in recent years had made a certain impact on drivers, and even posed threats to road safety. HyD however recorded an achievement rate of 100% in various performance indicators, including repairing holes on road surface. It showed that road users' degree of satisfaction on road repairs was different from the performance of the Administration. The Member therefore urged the Administration for a comprehensive review and revision of the

performance indicators.

11. At the Council meeting on 9 November 2011, a Member raised a Council question to express concern over road maintenance, such as the number of complaints or reports received about roads in need of maintenance from 2006 to 2010 and the mechanism to check and monitor road conditions. Another Member at the Council meeting on 30 January 2013 expressed worry that the Administration's progress to complete traffic improvement works, in particular those in the New Territories, was slow and enquired about measures that the Administration would take to prevent delays in such works.

Road safety

12. In December 2013, two Panel members, Hon Gary FAN Kwok-wai and Dr Hon KWOK Ka-ki, expressed their worry in writing on the incident of a screw protruding from the road surface of Tuen Mun Highway resulting in serious traffic delay on 30 November 2013. In addition, Hon TAM Yiu-chung subsequent to the incident asked a Council question on 12 February 2014 about the relationship between the road works and traffic accidents on Tuen Mun Road. According to the information provided by the Administration[7], since the incident might not have been induced by one single cause, the cause of the incident could only be ascertained until HyD and its contractor completed the analysis in the first quarter of 2014.

Use of environmental friendly materials

13. At the Panel meetings on 28 January 2011 and 21 June 2013, members generally welcomed the Administration's efforts in using recycled bituminous materials in road maintenance. They suggested increasing the ratio of bituminous waste used in production of new bituminous materials to maximize reuse of waste materials and continuing collaboration with tertiary institutions to research into the appropriate ratio of bituminous waste used in production of new bituminous materials.

Noise reduction

14. Some members at the Panel meetings on 28 January 2011 and 21 June 2013 showed concern about the effectiveness of recycled bituminous pavement materials in respect of noise reduction. The Administration responded that HyD had experimented with the use of

[7] Source: The Administration's response to the letters from Dr Hon KWOK Ka-ki and Hon Gary FAN Kwok-wai on the incident of a protruding screw on Tuen Mun Road issued in December 2013 (LC Paper CB(1)660/13-14(01))

different bituminous materials to reduce noise generated from tyres of vehicles. The result was however not very satisfactory, in particular on roads where there were frequent turning and braking actions of vehicles. The road surface was found to have worn out quickly. Nevertheless, the Administration mentioned that they would continue to explore the availability of new noise reducing materials which were more durable.

15. In 2014, when examining the Estimates of Expenditure 2014-15, a FC Member raised a written question expressing concern about the use low-noise thermal heating method for minor repair of pavement. He therefore enquired how many complaints the Administration had received about noise generated by pavement repair works using this method. In response, the Administration advised that HyD had received nine complaint cases in total from 2011 to 2013 in this regard.

Effectiveness of recycled technology in road maintenance

16. Members at the Panel meeting on 21 June 2013 were concerned about the effectiveness of adopting in-situ recycled technology with recycled bituminous materials as compared to the traditional bituminous pavement maintenance methods in road maintenance, in particular the durability and drainage property of recycled bituminous materials. In response, the Administration explained that they had examined the effect on the performance of the functional properties and durability of different layers of bituminous pavement arising from the incorporation of recycled materials. The research results showed that if the amount of recycled materials was lower than 15% of the total mass of the bituminous materials, the performance would be similar to brand new bituminous materials.

Cost

17. A member at the Panel meeting on 21 June 2013 showed concern about the difference in the cost for adopting in-situ recycling technology and traditional bituminous pavement maintenance methods, and the prevalence of the application of in-situ recycling technology in road maintenance. Members were given to understand that the initial cost of adopting in-situ recycling technology would be relatively higher than that of traditional methods as new machinery would need to be procured in particular. However, the relevant investment cost would be one-off only. In the long run, the cost difference between the two technologies was expected to be narrowed, given that the cost of the materials as well as the costs for transportation and disposal of bituminous waste associated with the in-situ technology would be lower.

Occupational safety

18. At the Panel meeting on 21 June 2013, members noted that the technology of thermal patchers for road maintenance utilized heat radiation to soften defective bituminous pavement. A member therefore expressed worry about the possible risk of heat stroke suffered by road maintenance workers under very hot weather and enquired if there were any guidelines governing the use of thermal patchers in this regard. The Administration advised that workers would not need to touch the heating parts of thermal patchers and so, the clothing of the road maintenance workers would be the same no matter if they were using the traditional methods or thermal patchers. In general, the Construction Industry Council had published guidelines for workers working in construction sites, which provided guidance on how construction workers working in hot weather would be protected.

Latest development

19. The Administration plans to brief members on maintenance of road pavements in Hong Kong at the Panel meeting to be held on 26 May 2014.

Relevant papers

20. A list of relevant papers is in **Appendix**.

Council Business Division 1
Legislative Council Secretariat
22 May 2014

Appendix

Maintenance of road pavements in Hong Kong

List of relevant papers

Date of meeting	Meeting	Minutes/Paper	LC Paper No.
28.1.11	Panel on Transport	Administration's paper on highway repair and maintenance by Highways Department - current approach and future development	CB(1)1130/10-11(04) http://www.legco.gov.hk/yr10-11/english/panels/tp/papers/tp0128cb1-1130-4-e.pdf
		Minutes of meeting	CB(1)1539/10-11 http://www.legco.gov.hk/yr10-11/english/panels/tp/minutes/tp20110128.pdf
		Administration's follow-up paper	CB(1)2249/10-11(01) http://www.legco.gov.hk/yr10-11/english/panels/tp/papers/tp0128cb1-2249-1-e.pdf
9.11.11	Council meeting	Hon KAM Nai-wai raised a question on road management and repair works	http://www.info.gov.hk/gia/general/201111/09/P201111080298.htm
--	Panel on Transport	Administration's paper on trial use of thermal patcher for small scale resurfacing of bituminous pavement	CB(1)1157/11-12(04) http://www.legco.gov.hk/yr11-12/english/panels/tp/papers/tpcb1-1157-4-e.pdf
30.1.13	Council meeting	Hon Albert HO raised a question on road works in New Territories	http://www.info.gov.hk/gia/general/201301/30/P201301300219.htm

Date of meeting	Meeting	Minutes/Paper	LC Paper No.
21.6.13	Panel on Transport	Administration's paper on recycling of bituminous pavement materials in road maintenance	CB(1)1298/12-13(05) http://www.legco.gov.hk/yr12-13/english/panels/tp/papers/tp0621cb1-1298-5-e.pdf
		Minutes of meeting	CB(1)466/13-14 http://www.legco.gov.hk/yr12-13/english/panels/tp/minutes/tp20130621.pdf
--	Panel on Transport	Administration's response to the letters from Dr Hon KWOK Ka-ki and Hon Gary FAN Kwok-wai on the incident of a protruding screw on Tuen Mun Road as set out in LC Papers Nos. CB(1)469/13-14(01) and CB(1)482/13-14(01)	CB(1)660/13-14(01) http://www.legco.gov.hk/yr13-14/english/panels/tp/papers/tpcb1-660-1-e.pdf
12.2.14	Council meeting	Hon TAM Yiu-chung raised a question on relationship between the road works and traffic accidents on Tuen Mun Road	http://www.info.gov.hk/gia/general/201402/12/P201402110498.htm
3.4.14	Finance Committee	Administration's replies to Members' initial written questions of the Estimates of Expenditure 2014-15 (Question Serial Nos. 0411, 2699 and 5315)	http://www.legco.gov.hk/yr13-14/english/fc/fc/w_q/thb-t-e.pdf

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