

## **Information Paper on Three Proposed Drainage Tunnels**

### **LegCo Panel on Planning, Lands and Works**

**Meeting on 4 January 2002**

**103CD - Drainage Improvement in Northern Hong Kong Island  
- Hong Kong West Drainage Tunnel**

**108CD - West Kowloon Drainage Improvement  
- Lai Chi Kok Transfer Scheme**

**111CD - Drainage Improvement in Tsuen Wan and Kwai Chung  
- Tsuen Wan Drainage Tunnel**

## **INTRODUCTION**

This paper addresses Members' concerns on the justifications for the proposed drainage tunnel schemes.

## **JUSTIFICATIONS**

2. The drainage systems in the urban areas of northern Hong Kong Island, West Kowloon, and Tsuen Wan/Kwai Chung were built several decades ago. The rapid urbanization of these areas in past decades has changed rural unpaved areas into built-up areas which results in a substantial increase in surface runoff. Consequently, the urban drainage systems are less capable of handling the surface runoff. Flooding frequently occurs at low-lying urban areas during heavy rainstorms.

3. The capacity of the existing drainage systems can be increased by enlarging or constructing additional drains or box culverts along busy roads in urban areas. However, due to congestion of underground utilities and limited road space available, this traditional approach is very often impracticable. In addition, this would require substantial amount of road opening in urban areas causing serious disruption to traffic, noise and other disturbance to the public. If the drainage tunnel schemes are not adopted,

some 44 km of additional drainage improvement works<sup>1</sup> along busy roads in these areas will be required. The proposed drainage tunnels would intercept and convey the surface runoff in mid-hill area for discharge into the sea. This helps to reduce the disturbance to the public and environment to a minimum.

4. The drainage tunnel schemes will require 4 years for construction but the traditional approach of enlarging drains and box culverts along urban roads would require 6 to 10 years. Undoubtedly, the drainage tunnel schemes can provide earlier flood relief in these areas, in addition to minimising disturbance to the public.

## **CONSEQUENCES OF NOT GOING AHEAD WITH THE TUNNEL PROJECTS**

5. Many of the highly urbanized areas in Central, Admiralty, Wan Chai, Causeway Bay, Sheung Wan, Kennedy Town, Lai Chi Kok, Sham Shui Po, Cheung Sha Wan, Tsuen Wan and Kwai Chung are currently exposed to the risk of flooding under severe rainstorms. The estimated flood depth under a 1 in 50 years rainstorm may exceed 600mm in some of the above areas causing risk to life and limb, property damage, nuisance to public and disruption to economic activity and traffic. If the drainage tunnel projects do not proceed, the flooding risk will continue to exist.

6. If the traditional approach is adopted, a much longer time will be taken to complete the works in the urban areas as depicted in para. 4 above. This will create great disturbance to the traffic and environment of the areas.

## **FINANCIAL IMPLICATIONS**

7. The estimated total project cost (including consultancy fees for site investigation and preliminary design, and detailed design and construction) for the three drainage tunnel projects are depicted below –

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<sup>1</sup> see Appendix for details.

	Total Project Cost \$ Million
Hong Kong West Drainage Tunnel (This scheme comprises the construction of drainage tunnels about 10.3 km in length and 4.9 metres to 7.2 metres in diameter)	1,700
Tsuen Wan Drainage Tunnel (This scheme comprises the construction of a drainage tunnel 5.4 km in length and 6.5 metres in diameter)	1,100
Lai Chi Kok Transfer Scheme (This scheme comprises the construction of drainage tunnels about 4.2 km in length and 1.5 metres to 5.6 metres in diameter)	800
<hr/> <hr/>	Total: 3,600

The estimated cost for the investigations and preliminary design consultancies for the proposed tunnels are \$54 million for Hong Kong West drainage tunnel, \$45 million for Tsuen Wan drainage tunnel and \$33 million for Lai Chi Kok drainage tunnel.

8. We have assessed the costs for the traditional approach of drainage improvement works along urban roads. The construction cost alone is comparable. Taking into account the social costs in terms of disruption to traffic and environment, the total costs will be very much higher.

9. Benefit-cost analyses have been carried out on the proposed tunnels, by comparing the costs with the benefits achievable from the corresponding reduction in flood damages. The benefits are the minimization of the flood damages including damages to properties/goods/merchandise, repair costs, traffic disruption and loss of business, etc. The results of the analyses indicate that benefits outweigh costs, even without taking into account the intangible items such as the possible loss of life, annoyance and other social losses. The benefit-cost ratios for drainage tunnel projects in Lai Chi Kok, Hong Kong West and Tsuen Wan are about 2.6, 2.3 and 1.6 respectively.

## **WAY FORWARD**

10. We plan to seek funding support in the coming PWSC meeting in January 2002 for engaging consultants to carry out site investigations, environmental impact assessments, physical modelling tests and preliminary design for the three tunnel projects.

11. Subject to the endorsement of the PWSC, we intend to start the investigation and preliminary design in 2002 for completion in 2004. We plan to start detailed design in 2004 for completion in 2006, followed by construction commencement in 2006 for completion in 2010.

**Works Bureau  
November 2001**

## Appendix

**Table 1 – Length of drains required to be improved in urban areas for flood protection**

	Length of drain required <u>with</u> tunnel scheme (km)	Length of drain required <u>without</u> tunnel scheme (km)	Additional length of drains without tunnel scheme (km)
Northern Hong Kong Island (Wan Chai, Central and Western districts)	3	18	15
Lai Chi Kok and Sham Shui Po area	13	35	22
Tsuen Wan and Kwai Chung area	1	8	7
			44