

**For discussion  
on 18 May 2004**

**LEGISLATIVE COUNCIL PANEL ON  
PLANNING, LANDS AND WORKS**

**Reprovisioning of Sha Tin Water Treatment Works and  
Delivering of Water Supply Distribution and Customer Services  
Using Public Private Partnership**

**Purpose**

This paper outlines the key findings and recommendations of the feasibility study on the reprovisioning of Sha Tin Water Treatment Works (STWTW) and delivery of water supply, distribution and customer services using the public private partnership (PPP) approach, and sets our proposals to invite comments before deciding on the way forward.

**Background**

2. Government has pledged to enhance public sector productivity, adhere to the principle of “big market, small government”, and make full use of the resources of the private sector to improve the efficiency and quality of public services. The PPP approach for providing public

services is not new to Hong Kong. Major public works such as tunnels and toll ways have been provided using PPP since the 1970s.

3. In the 2004 Policy Agenda, the Chief Executive committed to the wider use of alternative approaches, including Public Private Partnership (PPP), in the delivery of large scale projects under the Public Works Programme. In the 2004-05 Budget Speech, the Financial Secretary undertook to consider the way forward in the light of the encouraging results of the preliminary feasibility study on the in-situ reprovisioning of STWTW through the PPP approach.

### **Justifications For In-situ Reprovisioning Of STWTW**

4. The STWTW was commissioned in 1964 and currently provides a nominal capacity of over 1.2 million cubic metres of fresh water a day. As the largest water treatment works in Hong Kong, the treated water from the STWTW meets about 40% of the total water demand in the territory.

5. The reprovisioning of the STWTW is necessary because the plant and equipment there are old and require major renovation or replacement. The present operation at STWTW is not efficient by modern day standards, particularly in treating raw water of variable quality. There is more modern water treatment technology available for eliminating micro-organisms, such as giardia and cryptosporidia cysts

which may be present in raw water.

6. It is not practical to build a new replacement plant at an alternative location because substantially greater costs would be incurred by additional capital works associated with the construction of new raw water supply systems and treated water trunk systems. Owing to the physical constraints of the existing plant layout, it is necessary to undertake a phased programme for the reprovisioning of the existing buildings and equipment with new facilities, particularly water treatment modules using modern water treatment technologies. Funding for the implementation of the STWTW reprovisioning project has already been earmarked. An investigation study for the in-situ reprovisioning of the STWTW was conducted in 2003. The estimated cost of the project is over \$6 billion.

### **Feasibility Study For Using The PPP**

7. Government commissioned in November 2003 a consultancy to study the feasibility of applying the PPP approach to the reprovisioning of the STWTW on an in-situ basis while maintaining the water treatment output and requiring the private sector to operate the facilities after their reprovisioning is completed. In the light of comments and positive feedback from the private sector during the market enquiry exercise in early 2004, the consultants have examined further the feasibility and the extent to which a PPP approach could be used for the delivery of water

(both fresh and salt water) supply, distribution, customer and support services in designated parts of Kowloon and Sha Tin area (Sha Tin South) in addition to operating the STWTW.

8. Based on the research on the past experience of other jurisdictions and the findings of the study, the consultants concluded that it is both feasible and practical for Government to adopt a PPP approach to reprovisioning and operating STWTW. They are of the view that Government is more likely to attain better value for money and cost savings through a PPP approach as compared with the conventional procurement and internal reprovisioning model. Furthermore, it is likely to be beneficial to adopt a PPP approach for the water supply, distribution, and customer services as well.

### **Reprovisioning of STWTW using the PPP approach**

#### *(a) Potential benefits*

9. Using PPP for the STWTW project has the following potential benefits :

- (a) a single private sector operator responsible for the entire project delivery;
- (b) access to international water service providers' technology and management know-how and to develop solutions that better fit our needs;
- (c) more innovative integration of new and existing assets; and
- (d) minimise whole lifecycle costs by optimization between

construction and operation.

*(b) Business models*

10. Comparing the two PPP models applicable to STWTW, namely Design-Build-Operate (DBO) and Build-Own-Operate-Transfer (BOOT), the consultants concluded that Government would benefit from lower risks with a potentially higher chance of success under a BOOT arrangement. A table comparing the DBO and the BOOT models is at

Annex A Annex A.

**Provision of water supply, distribution and customer services in addition to STWTW reprovisioning itself using the PPP approach**

*(a) Potential benefits*

11. Similar to the use of the PPP approach for reprovisioning STWTW, the use of PPP in providing the water supply, distribution and customer services has the potential to bring benefits through improved management, enhanced services and possibly better financial outcome.

*(b) Business models*

12. The consultants have compared the three models of Operations and Maintenance (O&M) Contract, Lease and Concession regarding their respective compatibility with Water Services Department's overall service and business objectives and the potential to bring commercial and financial benefits. The consultants concluded that all three models are compatible with the BOOT model recommended for the STWTW

reprovisioning itself and could be implemented and provide benefits. A table comparing the salient points amongst the three models is at Annex B Annex B.

*(c) Potential service areas*

13. The extended feasibility study has also examined three different geographic service areas, namely the full, medium and small scale scenarios, under which the private sector operator will be responsible for the provision of water supply, distribution and customer and support services within a designated geographic area in addition to operating the STWTW. Under all scenarios, the billing and charging of water and related tariffs will remain the responsibility of WSD. The respective geographic scenarios cover up to 33% of the 2.6 million water accounts in the territory and include STWTW supply zones in Kowloon and Sha Tin South and adjacent areas in Kowloon East (see Map at Annex C). The consultants suggested that both the full and the medium scale scenarios would allow the private sector operator to achieve economies of scale, which would provide an operation base large enough to justify his investment in technology for improving efficiency and would allow benchmarking against those service areas operated by WSD. A table comparing the key features of the three scenarios is at Annex D.

## **Communication With Staff**

14. WSD has been keeping staff informed on the above feasibility

studies. Since August 2003, the Director of Water Supplies (DWS) has held meetings with staff representatives on this subject. To enhance the two-way communication with staff on matters concerning the feasibility study, DWS has set up a Special Consultative Committee which provides an ongoing forum for discussing the proposals and gathering feedback from staff. The first meeting of the Committee was held on 14 May 2004.

## **Implementation Issues**

15. The consultants have also identified the various risks for Government and the private sector operator associated with using a PPP approach in reprovisioning STWTW and delivering water supply, distribution and customer and support services thereafter. Noting that these risks would have significant implications for the successful adoption of the PPP approach, Government will thoroughly examine the possible risk mitigation or minimization strategies and the commercial principles involved before making a decision on whether and if so, the extent to which the PPP approach should be adopted. Apart from the technical and financial aspects, Government will also take into consideration other important factors, including potential implications for human resources, possible impact on the legislative and regulatory framework, the interfacing issues between public and private service operators and the feedback from interested parties and the public.

## Way Forward

16. We will publish the feasibility study reports on the homepage of the Environment, Transport and Works Bureau (ETWB) (<http://www.etwb.gov.hk>) for public information. Interested parties and members of the public are welcome to send their views in writing to the following addresses:

- (a) Policy and Development Section  
Works Branch  
Environment, Transport and Works Bureau  
11/F, Murray Building  
Garden Road, Central  
Hong Kong
- (b) Email address: [stwtw.ppp@etwb.gov.hk](mailto:stwtw.ppp@etwb.gov.hk)

17. We will consider the way forward in the light of the comments received. If Government finally decides to adopt the PPP approach for the reprovisioning of STWTW and the delivery of water supply, distribution, customer and support services, a detailed implementation study will be commissioned to draw up the necessary procurement and implementation process.

Works Branch  
Environment, Transport and Works Bureau  
14 May 2004

## Annex A

### Comparison of PPP models for reprofiling of STWTW

		<b>BOOT</b>	<b>DBO</b>
1.	Value for money	Higher	Lower
2.	Risk of private sector operator failing to perform	Lower	Higher
3.	Impact on Government cashflow pattern	Spread out during contract life	Front loaded in line with capital expenditure
4.	Asset ownership	Asset transfer mechanism required to be drawn up	Asset ownership remains with Government

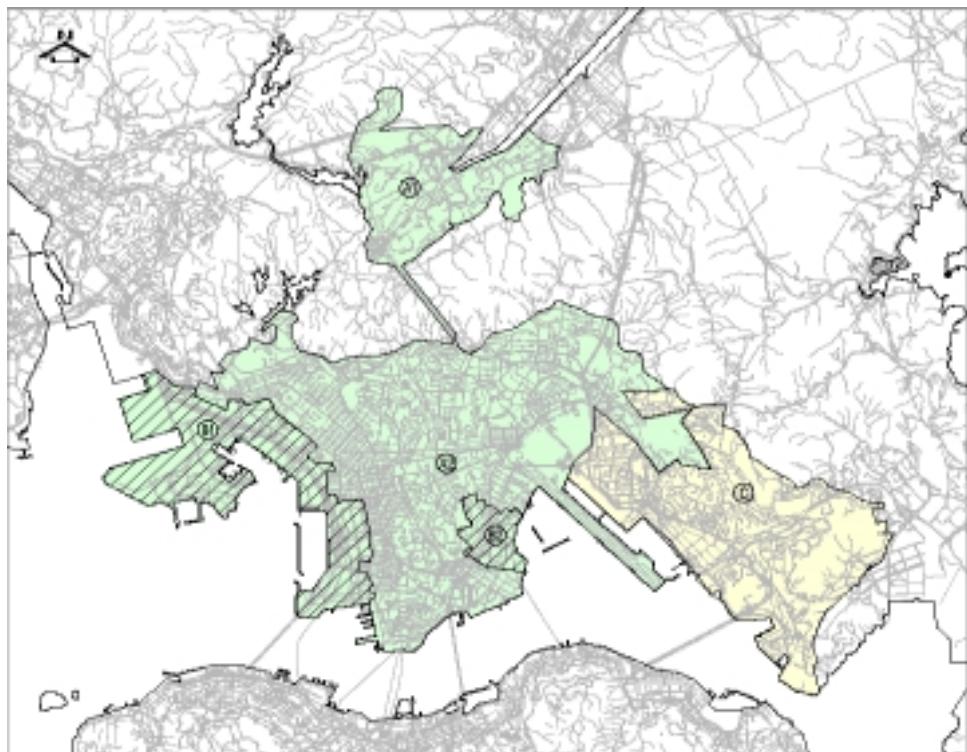
## Annex B

### Comparison of PPP models for water supply distribution and customer services

		O&M Contract	Lease	Concession
1	Matching of payment to private sector operator with water usage	Not matched	Closely matched	Closely matched
2.	Transfer of risk associated with rehabilitation and maintenance cost to private sector operator	Partially transferred	Partially transferred	Fully transferred
3.	Flexibility of capital investment programme	Highly flexible	Highly flexible	Pre-determined programme
4.	Government involvement in asset management	More involvement	More involvement	Less involvement

## Annex C

### **Map - Geographical Scenarios**



Geographic Scenarios	Area A1	Area A2	Area B1	Area B2	Area C
Small scale	✓				
Medium scale	✓	✓			
Large scale	✓	✓	✓	✓	✓

## Annex D

### Comparison of the use of PPP in the three geographic scenarios in addition to reprovisioning of STWTW

		<b>Small scale</b>	<b>Medium scale</b>	<b>Full scale</b>
1.	Scope	Sha Tin South + STWTW	Sha Tin South + Central Kowloon + STWTW	Sha Tin South + Entire Kowloon + STWTW
2.	Approximate % and number of water accounts involved	3%, 73,000	22%, 577,000	33% 862,000
3.	Estimated number of staff affected	157	532	800
4.	Economy of scale	Poor	Good	Good
5.	Interfacing between the private sector operator and WSD	More complicated	Very complicated	Less complicated
6.	Simplicity to implement	Relatively simple	Relatively complex	Relatively complex