Legislative Council Panel on Transport
Parking Meter System Replacement Programme

PURPOSE

This paper briefs members on the results of the trials undertaken for three types of multi-purpose stored value cards on parking meters and the proposal to replace existing meters with reloadable card operated parking meters.

BACKGROUND

2. In 1996, the Administration initiated a study on electronic parking meters with a view to replacing the obsolete mechanical parking meters, which accepted coins. After examining different options, we decided to start with a dedicated disposable card parking meter system as a first step because at that time a secure and reliable multi-purpose stored value card system was still in the development stage and there were no established specifications. Our master plan was to open up the parking system to accept reloadable cards at a later stage when such cards have been tried out. The electronic parking meters have therefore been designed in such a way to ensure that they could accept reloadable cards with limited modification of the software. In seeking funding approval for the procurement of electronic parking devices in 1996, we had hence also budgeted for a feasibility study to test the performance of the only two electronic purse cards available in the market at the time.

3. The Octopus system did not emerge until late 1997 but quickly developed into a popular transport card in 1998-99. To ensure that all reloadable smart cards available in the market would be covered in our feasibility exercise, we sought funds in 1999 for conducting a trial on Octopus operated parking meters to test the technical feasibility of this contactless stored value card for payment of parking meter fees.

PROPOSAL

4. The first batch of electronic parking meters that accepted Transport Department (TD)'s disposable e-Park card was installed in April 1998. The meters are now reaching the end of their useful life. In view of the recent development of reloadable cards, the Administration proposes to replace the parking meters with an Octopus only system from late 2002/early 2003, with sufficient capability for the meters to be upgraded to also accept other reloadable cards, including credit cards, in future.

JUSTIFICATION

Current Problems

5. The estimated useful life of the e-Park card operated parking meter mechanism is five years. These meters are found to be generally robust and reliable in terms of security and revenue collection but are approaching the end of their useful life. Furthermore, the current e-Park cards are non-reloadable and entail significant recurrent cost annually in terms of card procurement and handling. With the rapid development of reloadable cards in recent years, there are now more cost effective and environmentally friendly payment alternatives. In view of the foregoing, and the potential savings that can be achieved in card production cost with migration to reloadable cards, we had conducted trials on three reloadable cards since 2000.

6. Separately, the meter casings, inherited from the former mechanical coin-operated meters, have been in use for over 15 years and have reached the end of their useful life. They are found to be inadequate in protecting the electronic meter mechanism especially after heavy rainstorms. The current casings hence need to be replaced by new ones which will meet the requirements of reloadable card operated meter mechanism.

Trials with Reloadable Cards

7. From March 2000 to September 2001, we conducted trials on all three multi-purpose stored value cards approved by the Hong Kong Monetary Authority:

a) **Two Purse cards**: The two purse cards under test were Mondex and Visa Cash. To test public acceptance of the cards and the technical feasibility of adopting such a card system in an open-air environment, 1,400 parking meters in Wan Chai and Tsim Sha Tsui were converted to dual-card meters that accept one purse card in addition to the e-Park card. The trial was undertaken between March 2000 and March 2001.

b) **Octopus card**: Given Octopus card's growing popularity as a stored-value card in the public transport field, we started the trial on Octopus-only meters in November 2000. During the trial, meters developed by five different suppliers were installed at 200 parking spaces in Causeway Bay and Mongkok. The meters tried included single-bay, dual-bay and multi-bay meters. The trial was completed in September 2001.

8. Overall, all three cards were found to be technically feasible, performing well on parking meters in an outdoor, off-line, unattended environment. However, the utilisation of purse cards on the dual-card meters was very low, accounting for only 2% of the total transactions on the trial meters. This is mainly attributed to the low circulation of the cards (only around 200,000 cards in use for each of the two purse cards). For the Octopus trial, the machines were generally well accepted, with a high utilisation rate (82%) similar to that of the e-Park card operated meters at the same locations before the trial.

9. After completion of the trials, we invited the card service providers to submit an expression of interest on the provision of clearing house and associated services if their cards were accepted on future parking meters. By the closing date of 15 October 2001, only Octopus Cards Ltd. made a positive response. Neither of the two purse card service providers indicated any interest. In fact, some of the service providers for the purse cards announced their plan to discontinue the cards in the first quarter of this year.

Future Parking Meters

10. Having reviewed the trial results and the findings of the customer interview surveys conducted during the trial period, we propose to incorporate the Octopus card as a payment card for the new generation parking meters. Purse cards are not proposed to be incorporated into the new meter design in view of the absence of interest of the card service providers and the likelihood of gradual service cessation.

11. At the same time, we note that a few credit cards are developing facilities for off-line retail payment (with each transaction limited to around $200). Preliminary findings show potential for such credit cards to be adopted as a payment card for the new generation parking meters:

a) same as purse cards, these credit cards are capable of operating in an off-line environment without the need for input of a personal identification number or signature authorisation;
b) it is technically feasible for use on parking meters;
c) has high card circulation;
d) do not require card development cost by government;
e) proven efficient operation on payment settlement; and
f) proven security in revenue collection.

12. A comparison of the capital and recurrent costs for the existing e-Park card and the proposed one-card (Octopus only) and two-card (Octopus and Credit Card) parking meter system is set out below :

	e-Park card	Octopus Only	Octopus + Credit Card
Capital Cost	$ 75m	$90m	$114m
Annual Operating Cost	$ 61.2m	$52.8m	$53.4m
Annual Net Savings (as compared with the present e-Park card operation)	--	$8.4m	$7.8m

13. We note that a two-card system is more expensive. More importantly, an off-line payment service is now implemented only on one credit card (i.e., the Visa Express Payment) and is accepted by three merchants only (i.e., two fast food chain restaurants and a cinema group). The long term success and popularity of this service is not clear enough for us to make a firm recommendation to incorporate credit cards into the new parking meter at this stage.

14. In view of the fact that our parking meters are coming to the end of their economic life, the environmental desirability to replace the existing disposable card with a reloadable card and the net savings after the conversion to reloadable card meters, we propose to replace our meters with new ones that accept an Octopus only system at the initial stage but with sufficient capability for the meters to be upgraded to also accept other reloadable cards, including credit cards in future. Whether the credit card option should be pursued would be reviewed taking into account the future availability and utilisation of off-line credit card payment.

15. To achieve cost-effectiveness and to reduce street furniture, it is proposed that the new generation meters should be dual-bay parking meters capable of controlling two parking spaces. Dual-bay meters are preferred to multi-bay meters as they offer a better performance in terms of the size of the meter, public acceptance, enforcement and security in revenue collection, as reflected in the trial. The key design features of the proposed meter are shown at Annex A. The mechanism and the casing of the new Octopus operated parking meters are expected to have a serviceable life of seven and fourteen years respectively.

16. The actual meter design will be subject to tender results. The additional card slot is reserved for credit card or other magnetic strip type or chip-type smart card. We would require that the basic design of the new meter be upgradable to accept additional contact cards using the common card slot with necessary modification to the hardware and software.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

17. We estimate that the capital cost for implementation of the new Octopus only system would be $90 million, made up as follows:

Parking Meters with Octopus only		**Quantity**	**Total Cost ($)**
(a)	Dual-bay meters: casing, meter mechanism and Octopus readers, including 10% spares	11,000	69,300,000
(b)	Portable data retrievers, including 10% spares	80	3,200,000
(c)	Backend computer system with software	3	6,000,000
(d)	Miscellaneous	---	600,000
(e)	Electrical and Mechanical Services Trading Fund (EMSTF)	---	6,500,000
(f)	Contingencies (5% of (a) to (d))	---	3,955,000
		Total	**89,555,000**
		Say	**90,000,000**

18. As regards paragraph 17(a) above, the expenditure of $69,300,000 is for the acquisition of meter mechanism, Octopus card readers and the meter casings including the operation system software and application development tools, etc.

19. As regards paragraph 17(b), the expenditure of $3,200,000 is for the acquisition of the data retrievers, which will be used for retrieving transaction and management data from the on-street parking meters and thereafter uploaded to the central computer for processing. These data retrievers are also used for calibrating the parking meters in respect of the meter fee level and operating hours, etc.

20. As regards paragraph 17(c), the expenditure of $6,000,000 is for the installation of a total of three computer systems at the two depots of the management contractor and TD Headquarters respectively.

21. As regards paragraph 17(d), the expenditure of $600,000 is for conducting factory acceptance tests for the new meter system and equipment, and staff training for system management and operation, etc.

22. As regards paragraph 17(e), the expenditure of $6,500,000 is for paying the EMSTF engineering consultancy services.

23. EMSTF will oversee the above project which includes definition of hardware and software requirements for the new meters, preparation of project programme, tendering, supervision of type approval tests, testings and installations, as well as monitoring the performance of the meters and any maintenance problems after the initial installation until the end of 2005/06. In the light of the Enhanced Productivity Programme, the EMSTF has rationalised its costs and offered about 5% reduction on the charges. We consider the fees charged by EMSTF to be reasonable when compared to fees charged by consultancy firms in the private sector for projects of a similar nature.

24. The estimated cash flow for the project is set out below:

2002/03	$9,000,000
2003/04	$46,000,000
2004/05	$30,000,000
2005/06	$5,000,000
Total	**$90,000,000**

Cost Savings

25. As noted in paragraph 12, the proposed Octopus operated parking meter system will incur an estimated annual recurrent cost of $52.8 million. It is estimated that a recurrent annual net saving of around $8.4 million may be generated after full conversion to Octopus operated parking meters, due largely to savings in e-Park card production. The breakdowns of the recurrent annual operating costs and net savings are shown below :

Recurrent Annual Operating Costs	**e-Park card Meters (A)**	**Octopus Only Meters (B)**	**Recurrent Annual Net Savings (A)-(B)**
Transport Department's Contract Administration Cost	$ 1.8 m	$ 1.8 m	
Contractor's Fees	$ 47.4 m	$ 47.4 m	
Card Cost	$ 12 m	--	
Uploading Commission (Note)	--	$ 3.6 m	
Total	$ 61.2 m	$ 52.8 m	**$ 8.4 m**

(Note): A fee payable to the card service provider for its provision of transaction clearance and settlement service.

26. In addition to the recurrent annual net savings arising from the use of Octopus only meters, there will be a one-off cost avoidance totaling $65.9 million which will otherwise be required to gradually replace the existing meter mechanisms and casings as they come to the end of their useful life with effect from 2003/04. The cost and benefit for the project over the next 10-year period are summarised at Annex B.

IMPLEMENTATION PLAN

27. We plan to install the first batch of the new generation parking meters in late 2002/early 2003 and to complete the replacement programme by 2004/05. The feasibility of implementing credit cards on the new meters will be reviewed in late 2003/early 2004. If justified and subject to further funding approval (about $24 million), additional cards could be incorporated into the new meters from 2004/05.

THE WAY FORWARD

28. We will seek the approval of the Finance Committee on 10 May 2002 on funding for implementation of the above replacement project.

29. The Transport Advisory Committee noted on 26 February 2002 the Administration's proposal. Members generally supported the proposal.

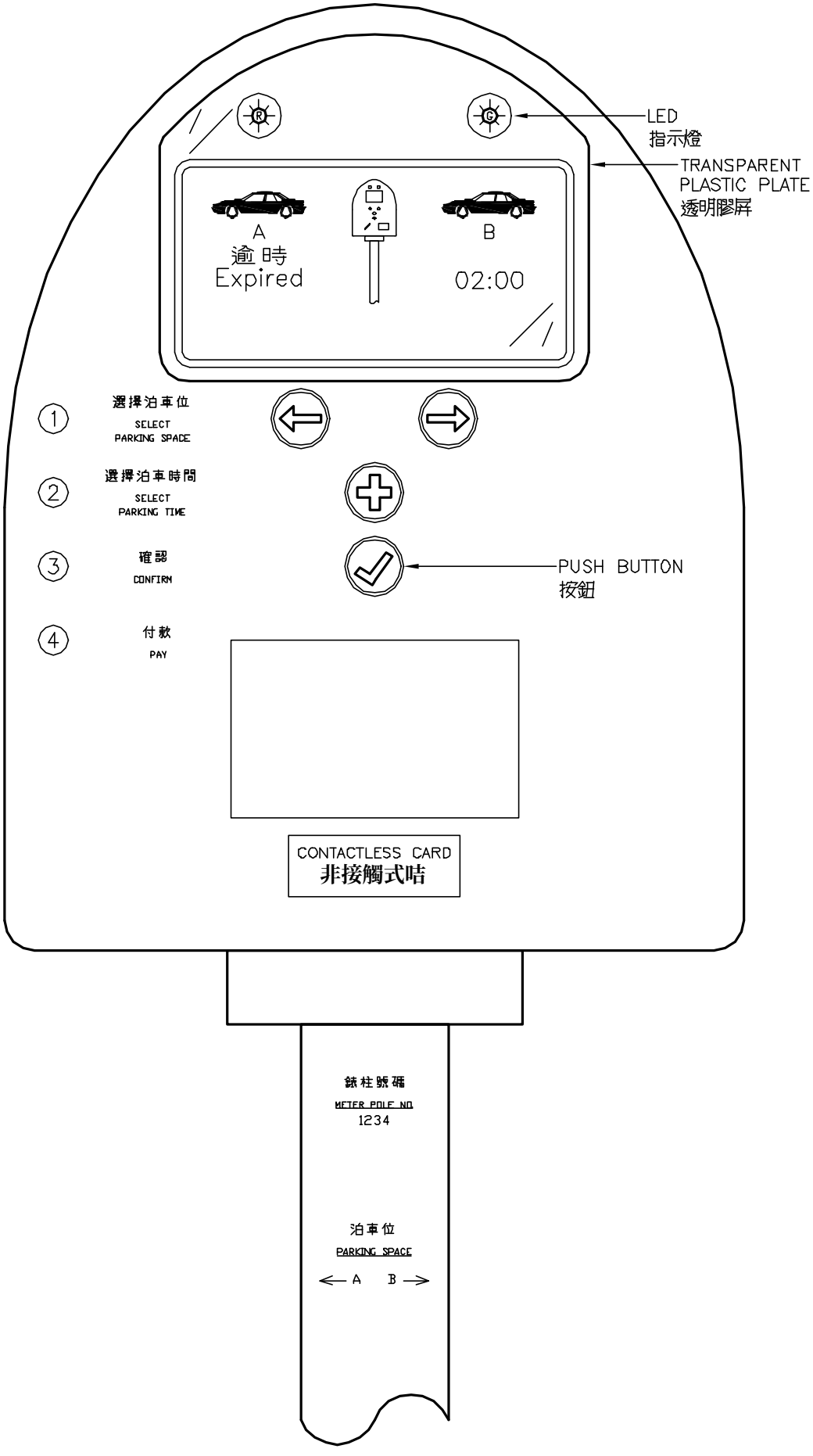
ADVICE SOUGHT

30. Members are invited to comment on the replacement project.

Transport Bureau
April 2002

Key Features of Proposed Parking Meter
計劃中停車收費錶的設計草圖

ANNEX 'A'
附件 'A'



Annex B

Cost-Benefit Analysis of Replaceemnt of the Parking Meter System
Octopus Only System
(at 2001-02 price level)

	2002-03 ($'000)	2003-04 ($'000)	2004-05 ($'000)	2005-06 ($'000)	2006-07 ($'000)	2007-08 ($'000)	2008-09 ($'000)	2009-10 ($'000)	2010-11 ($'000)	Total ($'000)
Costs										
Non-recurrent										
- expenditure	9,000	46,000	30,000	5,000	0	0	0	0	0	90,000
sub-total	9,000	46,000	30,000	5,000	0	0	0	0	0	90,000
Recurrent										
- contract administration	30	315	1,620	1,800	1,800	1,800	1,800	1,800	1,800	12,765
- contractor's fee	790	8,295	42,660	47,400	47,400	47,400	47,400	47,400	47,400	336,145
- uploading commission	60	630	3,240	3,600	3,600	3,600	3,600	3,600	3,600	25,530
sub-total	880	9,240	47,520	52,800	52,800	52,800	52,800	52,800	52,800	374,440
Total costs	9,880	55,240	77,520	57,800	52,800	52,800	52,800	52,800	52,800	464,440
Benefits (Savings)										
One-off										
-cost avoidance	0	11,912	33,522	7,657	12,898	0	0	0	0	65,990
sub-total	0	11,912	33,522	7,657	12,898	0	0	0	0	65,990
Annual										
- contract administration	30	315	1,620	1,800	1,800	1,800	1,800	1,800	1,800	12,765
- contractor's fee	790	8,295	42,660	47,400	47,400	47,400	47,400	47,400	47,400	336,145
- ePark card	200	2,100	10,800	12,000	12,000	12,000	12,000	12,000	12,000	85,100
sub-total	1,020	10,710	55,080	61,200	61,200	61,200	61,200	61,200	61,200	434,010
Total benefits	1,020	22,622	88,602	68,857	74,098	61,200	61,200	61,200	61,200	500,000
Net Benefits	(8,860)	(32,618)	11,082	11,057	21,298	8,400	8,400	8,400	8,400	35,560
Cumulative Benefits		(41,478)	(30,396)	(19,339)	1,960	10,360	18,760	27,160	35,560	

Assumptions:

1 1,000 new dual-bay Octopus card operated meters will be installed by Feb 2003;

2 3,000 new dual-bay Octopus card operated meters will be installed by Jan 2004; and

3 6,000 new dual-bay Octopus card operated meters will be installed by 2004/05.