For discussion **FCR(1999-2000)72**
on 10 March 2000

ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND
HEAD 710 - COMPUTERISATION
Hong Kong Police Force
New Subhead "Replacement of the Criminal Intelligence Computer System and the Enhanced Police Operational Nominal Index Computer System"

Members are invited to approve a new commitment of $66,170,000 for replacing the Criminal Intelligence Computer System and the Enhanced Police Operational Nominal Index Computer System of the Hong Kong Police Force.

PROBLEM

The Criminal Intelligence Computer System (CICS) and the Enhanced Police Operational Nominal Index Computer System (EPONICS) of the Hong Kong Police Force can no longer fully meet the current operational needs of the Police Force.

PROPOSAL

2. The Commissioner of Police (CP), with the support of the Secretary for Security and the Director of Information Technology Services, proposes to develop new computer systems to replace the CICS and EPONICS currently used by the Force.

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JUSTIFICATION

Existing CICS and EPONICS

3. Both CICS and EPONICS are operation support systems. CICS is used for assisting the Police in the gathering and analysis of criminal intelligence. It was developed in two phases, completed in April 1989 and August 1993 respectively. The system is mainly used by the Criminal Intelligence Bureau (CIB), Narcotics Bureau, Commercial Crime Bureau, and the Organised Crime and Triad Bureau. Restricted access to the system has also been extended to Regional Intelligence Units and District Intelligence Squads since the end of 1999. The system enhances the Police's ability to detect and prevent crime, in particular organised crime, and is essential to the Police's crime investigation activities.

4. EPONICS was installed in 1991 for the Criminal Records Bureau (CRB). It maintains the central repository of criminal records in Hong Kong and details of all persons who are classified by the Police as "Missing Persons" or "Wanted Persons". The system is vital to the daily arrest and prosecution process because Police formations need to submit arrest documents to CRB for criminal record verification and to Identification Bureau (IB) for fingerprints verification in arranging cases for court proceedings. The Police have to submit Conviction Summary Reports and Fingerprint Reports to the Court before 9 a.m. on the first day of the proceedings. EPONICS also provides interfacing with the Police Enhanced Command and Control Computer System in support of Police's "stop and search" operations on the streets by checking the lists of "Missing or Wanted Persons" recorded in the system.

5. At present, EPONICS provides batch interface with CICS, through which information of criminal records is copied to CICS in batches automatically on a regular basis. Interfaced with the Computer Aided Fingerprint Identification System (CAFIS) and the Photo Album Library (PAL), EPONICS also provides useful information for general crime investigations. In addition, as EPONICS is connected to the Modus Operandi Computer System, police officers can make use of the conviction records held in the system to conduct research regarding offenders' modus operandi. EPONICS is widely used in the Police Force and is essential to its daily operation. The system is also used by other law enforcement agencies such as the Customs and Excise Department, Immigration Department, Independent Commission Against Corruption and the Judiciary.

/***Constraints*** *…..*

Constraints of the existing systems

6. CICS and EPONICS are running on the same mainframe computer system used since 1989 when the first phase of CICS was installed. They are text-based and not user-friendly. Users need to be familiar with the command codes and syntax. The major constraints of the existing systems are as follows -

(a) *System rigidity* – Criminal intelligence in CICS is provided by users from various bureaux and units of Crime Wing of Police Headquarters and from regional and district intelligence units. Under the current CICS, which is a text-based system and operates with a command line interface, users need to prepare the intelligence information in a specified format by filling in a form that is specially designed for such purpose and send it to CIB for input into the system. For intelligence collected from other sources including outside parties, CIB officers also need to re-input the data into the system. As it takes time for CIB officers to clarify the information with the sources once there is any deviation from the specified format and to vet the data after each input, intelligence held in the system may not be updated immediately. The effectiveness of the system may in turn be hindered. The rigid requirement of submitting information in a specified format may also discourage CICS users or other officers to provide intelligence to be input into the system.

(b) *Excessive and ineffective documents flows* – Under the present EPONICS, Police formations pass the arrest documents to CRB and IB for criminal record and fingerprints verification in paper forms. These documents as well as reports produced subsequently by CRB and IB are delivered manually. As Conviction Summary Reports and Fingerprint Reports have to reach ten Courts before 9 a.m. every day, the Police have to deploy six riders to collect arrest documents for about 250 to 350 cases from 60 police stations and deliver them to CRB and IB for verification and processing from 4:30 a.m. to 6:00 a.m. every day. After completing the processing, usually at around 8:15 a.m., the riders have to deliver the Conviction Summary and Fingerprint Reports to various Courts for proceeding. This creates a workflow bottleneck that has a significant impact on the efficiency of CRB and IB. In addition, without a direct on-line access to EPONICS, all Police formations have to pass their requests for any changes to the lists of "Missing or Wanted Persons" to CRB by electronic mail, which have to be re-input into the system by CRB officers.

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(c) *Slow response time* – Despite the enhancement in processing power and capacity under the second phase of CICS in 1993, the response time for CICS has lengthened since December 1999 with the growth of data and users from Regional Intelligence Units and District Intelligence Squads. More importantly, the CICS and EPONICS can no longer meet the operational needs of the Police.

(d) *Lack of integration and high maintenance costs* – The proprietary platform of the existing systems makes it difficult to fully interface with other systems and be further upgraded. The proprietary platform also also poses a restriction on the choice of system support resources from the market and gives rise to difficulty in integrating with products other than those from the supplier. The maintenance cost is also high due to the restriction on the choice of system support resources from the market under the proprietary platform. Moreover, the systems are not able to accept and process Chinese data. Nor can they handle graphical data like maps which are very useful to Police operations.

Proposed systems

7. In view of the constraints of the two existing systems, we propose to replace them with a new CICS and EPONICS that can better meet the Police's operational requirements. The new mainframe computer system will provide a stable and reliable environment to support the operation of CICS and EPONICS. It will have sufficient processing power and capacity to enable direct data updating by user formations and facilitate data sharing with other Police information systems. The new systems would have an estimated life span of at least ten years.

8. The proposed new CICS and EPONICS will have the following major benefits -

(a) The proposed CICS does not require data to be input with fixed command codes and syntax and is more user-friendly. Having direct access to the system, CICS users can input the information themselves or scan the source documents into the system directly to create or update the information without the need to transmit the information on paper form for data input. Integrated with other information systems, the proposed EPONICS will also enable Police formations to update the lists of "Missing or Wanted Persons" directly. The direct inputting by users will enhance the effectiveness of the systems in facilitating Police daily work and operations such as obviating the need for rider service mentioned in paragraph 6(b) above;

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(b) enabling direct input of data into the two systems will not only improve the efficiency but also the data accuracy because it obviates the need to re-input the same data into different computer systems;

(c) the new CICS can support bilingual processing and multi-media processing. Searches can be conducted in Chinese mixed with English. Information in the form of sketches of criminal video and audio can also be input and processed by the system. The new EPONICS will also support bilingual processing and hence accept and process both English and Chinese data;

(d) relieved from the collecting and data inputting work, CIB users can spend more time on analysis of criminal intelligence rather than data input and verification;

(e) the improved intelligence analysis functions of the proposed systems will provide more sophisticated and advanced analytical tools to assist intelligence analysts and investigators. The enhanced features of the CICS can perform intelligence data analysis including pattern and trend. For example, users will be able to project crime patterns and have a quick overall view of sophisticated or complicated crimes;

(f) the enhanced search facilities and improvements in the structures of the database will shorten the processing time required to search the data for details of suspects, complainants and other entities. Intelligence information can also be produced in real time; and

(g) the proposed EPONICS will allow direct access by Police formations and the Court and hence enable automatic processing of arrest documents. With the new system, Police formations can transmit arrest documents including fingerprints electronically to Police information systems including EPONICS, CAFIS, PAL, etc. for verification. Conviction Summary and Fingerprint Reports can also be passed to the Court by electronic means.

Cost and benefit analysis

9. The proposed new systems will give rise to realisable savings of about $7,907,000 annually, of which $3,010,000 is the annual maintenance cost of the existing systems and $4,897,000 is recurrent staff savings of 12 posts (two Sergeants, eight Constables and two Confidential Assistants). In addition, the new systems will achieve notional savings of $5,920,000 in staffing resources annually arising from improvement in efficiency of the Police Force. Although the notional savings are not realisable in financial terms, CP will re-deploy the staff resources saved to support front-line operations and intelligence analysis.

Encl. A detailed cost and benefit analysis is at the Enclosure.

FINANCIAL IMPLICATIONS

Non-recurrent cost

10. Drawing reference to the information systems currently used by the Police and market surveys, CP estimates that the implementation of the proposed CICS and EPONICS will require a non-recurrent commitment of $66,170,000, made up as follows -

		($'000)	
(a)	Computer hardware		13,790
	(i) Production servers	10,120	
	(ii) Disaster recovery server	3,220	
	(iii) Fingerprint scanners	450	
(b)	Computer software		9,690
	(i) Operating system	2,120	
	(ii) Database management system	5,640	
	(iii) Relational data link chart analysis tool	1,930	
(c)	System development and implementation services		28,090
	(i) Development of core system	13,660	
	(ii) Development of workflow management system	3,120	
	(iii) Development of system interface	9,240	
	(iv) Site preparation	2,070	
(d)	Data conversion services		3,120
(e)	Project management (employment of contract staff)		5,860
(f)	User training		730
(g)	Contingency (8% of (a) to (f))		4,890
	Total		**66,170**

11. As regards paragraph 10(a) above, the estimated cost of $13,790,000 is for the acquisition of computer and data security hardware, including three clustered servers, two workflow management servers and 60 fingerprint scanners.

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12. As regards paragraph 10(b) above, the estimated cost of $9,690,000 is for the acquisition of operating system software, database management system software and relational data link chart analysis tool. The software is required for storage, retrieval and concurrent access of information from CICS and EPONICS. The analysis tool enables the users to make crime analysis based on the data stored in CICS.

13. As regards paragraph 10(c) above, the estimated cost of $28,090,000 is for system development and implementation services. These include site preparation work, and interfaces with other operational systems.

14. As regards paragraph 10(d) above, the estimated cost of $3,120,000 is for the acquisition of data conversion services as data stored in the existing systems need to be converted and transcribed to the proposed CICS and EPONICS.

15. As regards paragraph 10(e) above, the estimated cost of $5,860,000 is for engaging contract staff to provide support in project planning, design and monitoring, system support, liaison with end-users and other Government departments, procurement, implementation, data conversion, and user acceptance testing. It comprises 48 man-months of Contract Project Manager and 96 man-months of Contract System Analyst.

16. As regards paragraph 10(f) above, the estimated cost of $730,000 is for the provision of training for 400 users on new system functions, basic intelligence analysis and system administration.

17. The estimated cash flow will be as follows -

	($'000)
2000-01	1,570
2001-02	18,300
2002-03	25,200
2003-04	20,600
2004-05	500
Total	**66,170**

/**Recurrent** .....

Recurrent cost

18. Recurrent expenditure of $608,000 will start to be incurred in 2004-05 rising to $9,560,000 in a full year from 2005-06 onwards. This will be fully offset by the annual saving from the running costs of the existing systems. We estimate that there will be savings of $5,419,000 in annually recurrent cost in 2004-05, $6,157,000 in 2005-06 and $7,907,000 from 2006-07 onwards, broken down as follows -

	2004-05	**2005-06**	**2006-07**
		($'000)	
Running costs of the new systems			
(a) Computer hardware maintenance	0	3,380	3,380
(b) Computer software licence and support	0	1,630	1,630
(c) Project management support (employment of contract staff)	608	1,460	1,460
(d) Application maintenance	0	3,090	3,090
Sub-total	608	9,560	9,560
Less			
Running costs of the existing systems			
(e) Savings on maintenance cost	5,237	12,570	12,570
(f) Savings on staff costs including on cost	790	3,147	4,897
Sub-total	6,027	15,717	17,467
Net savings	**5,419**	**6,157**	**7,907**

19. As regards paragraph 18(a) above, the estimated cost of $3,380,000 is for hardware maintenance on expiry of the free warranty period in 2005-06.

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20. As regards paragraph 18(b) above, the estimated cost of $1,630,000 is for the licence fee and support for the system software, database management software, intelligence analysis software and system development tools on expiry of the free warranty period in 2005-06.

21. As regards paragraph 18(c) above, the estimated cost of $1,460,000 is for project management contract staff, comprising one Contract Project Manager and two Contract System Analysts. They will provide project management, co-ordination with users and technical support teams, contract management and system performance monitoring.

22. As regards paragraph 18(d) above, the estimated cost of $3,090,000 is for on-going application support 24 hours per day for system operation, minor enhancement, infrastructure support on database administration, network, and system performance tuning by the vendor upon expiry of the free warranty period in 2005-06.

23. As regards paragraph 18(e), the sum of $12,570,000 is the annual maintenance costs of the existing systems.

24. As regards paragraph 18(f), it is the saving of the posts to be deleted upon commissioning of the new systems. The number of posts to be deleted will be five (three Constables and two Confidential Assistants) from November 2004 onwards, rising to 12 (two Sergeants, eight Constables and two Confidential Assistants) from November 2005 onwards.

Implementation

25. CP plans to implement the proposed systems according to the following schedule -

	Activity	**Target completion date**
(a)	Specification preparation	September 2000
(b)	Tendering and awarding contract	June 2001
(c)	System development	April 2003
(d)	Installation of the new CICS and EPONICS	May 2004
(e)	Roll-out of the new CICS	November 2004
(f)	Roll-out of the new EPONICS	November 2005

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The core system replacement for the new CICS and EPONICS will be completed during 2003-04, with the roll-out of the new CICS to be completed by November 2004 and the roll-out of the new EPONICS to other formations to be completed by November 2005.

OTHER PROPOSALS CONSIDERED

26. CP has considered various alternatives of achieving the increased functionality required for the CICS and EPONICS and concluded that a move towards an "open standard" platform, i.e. the proposal set out in the paper, will be the most cost-effective option. An enhancement of the existing systems is technically feasible but not preferred because both the project and recurrent maintenance costs will be higher than the proposed replacement.

BACKGROUND INFORMATION

27. We consulted the Legislative Council Panel on Security on the proposal on 28 January 2000. The Panel agreed to the need to replace the existing CICS and EPONICS from the security and operational points of view but requested for further details about the cost estimation. We have subsequently provided to the Panel supplementary information as set out in paragraphs 10 to 24 above.

Security Bureau
March 2000

Enclosure to FCR(1999-2000)72

Replacement of the Criminal Intelligence Computer System and the Enhanced Police Operational Nominal Index Computer System

Cost and benefit analysis

	2003-04 (Year 0)	2004-05 (Year 1)	2005-06 (Year 2)	2006-07 (Year 3)	2007-08 (Year 4)	2008-09 (Year 5)	2009-2010 (Year 6)
	($ million)						
a. Capital	65. 7	0.5	-	-	-	-	-
b. Running Cost (New)	-	0.6 (Note 1)	9.6	9. 6	9. 6	9. 6	9. 6
c. Running Cost (Existing)	-	5.2 (Note 2)	12.6	12.6	12.6	12.6	12.6
d. Savings (Note 3)							
Staff (realisable and notional)	-	2.9	8.5	10.8	10.8	10.8	10.8
System maintenance (c - b)	-	4.6	3.0	3.0	3.0	3.0	3.0
e. Net Savings (Note 4)	-	7.5	11.5	13.8	13.8	13.8	13.8
f. Accumulated Savings (Note 5)	(65. 7)	(58.7)	(47.2)	(33.4)	(19.6)	(5.8)	8.0 (Note 6)

Notes

1. We assume that running cost is not required under free warranty for Year 1 and only project management support is required.

2. Running cost of the two existing systems will only be required up to October 2004.

3. The proposed new systems will give rise to realisable savings of $7.9 million from 2006-07 onwards, of which $3 million is from the saving of annual maintenance cost of the existing systems, and $4.9 million is from staff saving, making up of 2 Sergeants and 5 Constables in the Criminal Records Bureau (CRB), and 3 Constables and 2 Confidential Assistants in the Criminal Intelligence Bureau (CIB). In addition, the new systems will achieve notional savings of $5.9 million, making up of 15.5 Constables. These posts are fragmented from various formations and units and could not be realised. Staff savings from CIB would be realised from November 2004 onwards and from CRB from November 2005 onwards when roll-out of automated arrest processing to each police station has completed.

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4. Net savings calculated as : Savings (staff) + Savings (system maintenance).

5. Accumulated savings calculated as : Accumulated Savings (Previous year) + Net Savings - Capital.

6. Payback period for a capital investment of $66.2 million with an annual net saving of $13.8 million is about six years.