ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND
HEAD 710 – COMPUTERISATION
Hong Kong Police Force
New Subhead "Computer Assisted Palmprint and Fingerprint Identification System"

> Members are invited to approve a new commitment of $59,576,000 for installing a Computer Assisted Palmprint and Fingerprint Identification System.

PROBLEM

The Computer Assisted Fingerprint Identification System (CAFIS) of the Hong Kong Police Force (HKPF) is expected to reach its maximum capacity in 2008. Failure to replace the system with a new one will jeopardise the effective operation of the criminal justice system of Hong Kong.

PROPOSAL

2. To maintain the effective and reliable operation of fingerprint searching and matching processes to meet the needs of our law enforcement agencies (LEAs) and the criminal justice system, and taking into account technological advances and overseas experience, the Commissioner of Police (CP), with the support of the Secretary for Security, proposes to create a new commitment of $59,576,000 to install the Computer Assisted Palmprint and Fingerprint Identification System (CAPFIS) to replace CAFIS.

/JUSTIFICATION .....

JUSTIFICATION

Existing CAFIS

3.　　　　CAFIS has been in place since 1997 and has played a crucial role in the effective operation of the criminal justice system of Hong Kong. As at the end of 2004, the CAFIS databases consisted of about 903 000 tenprints and 56 000 latent prints. Tenprints refer to fingerprints taken from convicted persons, where all ten fingers are inked and recorded. Latent prints are prints collected from scenes of crime or exhibits. In addition, the CAFIS databases temporarily store the tenprints of arrested persons pending trial; these fingerprints are destroyed once the person involved is discharged.

4.　　　　CAFIS provides centralised fingerprint services to all end-users in the criminal justice system, by helping to –

(a) **establish a subject's identity and criminal history**
Each person's fingerprints are unique. Fingerprints are therefore a very reliable means to establish a person's identity. When a person is arrested by the LEAs, including the HKPF, Immigration Department, Customs & Excise Department and Independent Commission Against Corruption, a CAFIS search will establish the subject's true identity if his fingerprints have already been captured in the CAFIS databases. If there is a positive match, the corresponding reference number in the Criminal Records Bureau (CRB) of the HKPF will reveal the subject's criminal history.

(b) **facilitate court sentencing**
There is a long-standing requirement for all LEAs to provide the criminal record of a convicted person to assist the courts in the award of sentences. A CAFIS search followed by a corresponding criminal records search, if applicable, helps to provide the necessary record.

(c) **investigate crime**
CAFIS is a very powerful tool in assisting crime investigation conducted by the LEAs. Fingerprint is one of the important trace evidence left at a crime scene by the criminal in the course of committing an offence, which is always an irrefutable proof to connect a suspect with a crime. CAFIS enables speedy searching of fingerprints recovered from crime scenes/exhibits against a convicted person's prints already filed in the system database. Likewise, an arrested person's fingerprints can be checked against the database of unsolved crime-related fingerprints. CAFIS is pivotal to achieving swift identification of suspect(s) to a crime.

/(d) .....

    (d)   **provide ancillary services**
CAFIS provides reliable ancillary services such as those in relation to the applications for Certificates of No Criminal Conviction for emigration purposes and requests for access to Criminal Conviction Data Record under the Personal Data (Privacy) Ordinance. A CAFIS search will indicate whether a person is a convicted person, in accordance with the records kept in CRB.

The Need to Replace CAFIS with CAPFIS

5.   The tenprint and latent fingerprint archives in CAFIS are now reaching nearly 83% and 90% of the respective design capacities. The HKPF has undertaken a review of CAFIS, taking into account the operational need of the LEAs and technological advances in the last decade. With the tenprint and latent print databases growing at about 5% and 3% per annum, CAFIS is expected to reach its maximum capacity in 2008 for both databases. When the hardware capacity reaches its ceiling, CAFIS will not be able to accept new fingerprint records without removing existing records from the system. This will lead to unreliable matching results and is totally unacceptable from the law enforcement and criminal justice points of view. One option is to expand the hardware capacity of CAFIS to accommodate the continuous growth of the fingerprint databases. However, the sole supplier for the necessary hardware (e.g. disc and matching equipment) for upgrading the existing CAFIS has discontinued production of the hardware.

6.   In view of the above, we propose to replace CAFIS with a new system that can better meet the LEAs' operational requirements.

Anticipated Benefits

7.   The proposed CAPFIS will have the following major benefits, as compared with the existing CAFIS –

    (a)   **Enhanced search accuracy**
At present, CAFIS is maintaining a search accuracy of 99% for the search of tenprints against the tenprint database, and 80% for the search of latent prints against the tenprint database. In line with established international practice, the list of suggested target prints generated by CAFIS upon a search is further processed and verified manually to ensure there will absolutely be no "wrong identification". Continued development of new algorithm, in particular for latent print searches, has enabled improvements to the process. Currently, leading vendors in the market are able to provide more sophisticated

search algorithm for improving accuracy rate of a computer search of latent prints up to 90%. With the implementation of CAPFIS, we will be able to make use of the new technology to enhance the efficiency of the investigation process.

(b) **System expansion capability**
The proposed CAPFIS is expected to have a hardware capacity to accommodate an anticipated growth of the latent print and tenprint databases for ten years. It is estimated that CAPFIS will be able to store 2 100 000 tenprints, 850 000 palmprints, 140 000 latent fingerprints and 100 000 latent palmprints. CAPFIS will also allow system modifications to cater for business changes from time to time after the system is implemented. The software can be updated and upgraded to cope with advancement in fingerprint/palmprint matching technology.

(c) **Conformity to international standards and better exchange of intelligence**
The existing CAFIS was built on a standalone computer system infrastructure and lacks capability to inter-connect with other computer systems. Moreover, the input to and output from the system are not compliant with the internationally-accepted standards for fingerprint transmission set by the National Institute of Standards and Technology (NIST), which were approved by Interpol in July 2000. The proposed CAPFIS will conform to NIST standards and allow better exchange of intelligence among local LEAs and with overseas agencies in combating terrorism and cross-boundary crimes.

(d) **Enhanced processing speed**
The proposed CAPFIS will have a faster processing speed, thereby enhancing search efficiency, which is critical for the speedy identification and apprehension of suspects. Specifically, in processing a latent fingerprint for crime investigation, the new system is capable of producing search results in 10 minutes whilst the existing CAFIS would need 40 minutes.

(e) **Disaster recovery capability**
The proposed CAPFIS will be equipped with an enhanced backup server accommodated at a separate site to support essential services such as tenprint to tenprint search functions in case the main server was destroyed in a disaster. The enhanced backup server enables a recovery of data in three days' time whilst the existing CAFIS would require one month for the recovery.

8.   An added feature of the proposed CAPFIS is its ability to handle palmprints, on top of fingerprints. The computerised identification technology is moving on a fast track, in particular the rapid technological advances in palmprint identification which is heralded as the greatest breakthrough in the fingerprint community. Such technology has already been utilised worldwide by many overseas LEAs in crime investigation and is producing good results.

9.   There were about 28 400 latent fingerprints and 8 100 palmprints discovered at scenes of crime/exhibits in Hong Kong in 2004. Currently around 35% of the unsolved latent marks are palmprints, which could only lie dormant until suspects are identified and their palmprints thereafter collected for manual comparison against the latent prints discovered. Because of such limitation, valuable evidence of palmprints could not be used for bringing offenders to justice.

10.   In addition, according to experience, there is difficulty in recording good quality fingerprints for about 1% of arrested persons due to their skin conditions. However, they can still have good palm skin conditions and palmprint identification would then be a better solution than fingerprints.

Cost and Benefit Analysis

Encl. 1   11.   A cost and benefit analysis on the CAPFIS is at Enclosure 1.

Notional savings

12.   The proposed CAPFIS will achieve notional savings of $1,210,000 in staffing resources annually arising from improvement of efficiency of the HKPF. CP will re-deploy the notional savings in staff resources to support the proposed system.
Encl. 2   We set out at Enclosure 2 a detailed breakdown of the notional savings and its re-deployment.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

13.   Drawing reference from the information systems currently used by the HKPF and market surveys, we estimate that the implementation of CAPFIS will require a total non-recurrent expenditure of $59,576,000 over a three-year period from 2005-06 to 2007-08, broken down as follows –

	2005-06 $'000	2006-07 $'000	2007-08 $'000	Total $'000
(a) Hardware		4,456	4,456	8,912
(b) Software		17,824	17,824	35,648
(c) System development and implementation services		3,500	3,500	7,000
(d) Data conversion services		2,500	2,500	5,000
(e) Project management	472	472	472	1,416
(f) Miscellaneous (site preparation, training, consumables, etc.)		800	800	1,600
Total	**472**	**29,552**	**29,552**	**59,576**

14.   On paragraph 13(a) above, the estimate of $8,912,000 is for the acquisition of hardware, including $1,912,000 for disaster recovery services. Hardware includes general computer equipment (such as production and disaster management servers, workstations and printers) and scanning equipment (such as live scanners and flat-bed scanners).

15.   On paragraph 13(b) above, the estimate of $35,648,000 is for the acquisition of software, including $9,048,000 for disaster recovery services. Software includes fingerprint and palmprint matching system for capturing and matching of tenprints, palmprints and latent prints, as well as system software.

16.   On paragraph 13(c) above, the estimate of $7,000,000 is for system installation, customisation and development of interfaces with other Force operational systems.

17.   On paragraph 13(d) above, the estimate of $5,000,000 is for the acquisition of data conversion services to convert and transcribe tenprints and latent prints data in the existing system, as well as palmprints and latent palmprints in hard-copy format, to the proposed system.

18.   On paragraph 13(e) above, the estimate of $1,416,000 is for engagement of contract staff to supplement the in-house project management team for a duration of 36 months to provide support in project planning, procurement, system acceptance and contract management.

19.   On paragraph 13(f) above, the estimate of $1,600,000 is for site preparation including the upgrading of data communication link, electricity supply facilities, trunking and cabling; training of trainers, end-users and system administrators on new system functions and system administration; and acquisition of start-up consumables such as backup tapes, toner cartridges and printer toner.

Recurrent Expenditure

20.   We estimate that the recurrent expenditure arising from the project is $8,289,000 per annum as from 2008-09, broken down as follows –

	2008-09 and onwards $'000
(a) Hardware maintenance	887
(b) Software maintenance	5,019
(c) System support services	2,261
(d) Consumables	100
(e) Communication network	22
Total	**8,289**

21.   On paragraph 20(a) above, the estimated annual expenditure of $887,000 is for hardware maintenance. This includes services to attend to all the hardware faults and disaster recovery services.

22.   On paragraph 20(b) above, the estimated annual expenditure of $5,019,000 is for software maintenance. This includes services to attend to all the software faults, provision of software updates and upgrades and disaster recovery services.

23.   On paragraph 20(c) above, the estimated annual expenditure of $2,261,000 is for acquiring ongoing support service provided by external service providers. This includes round-the-clock technical service to CAPFIS, technical support to end-users, system administration and configuration, system changes and performance tuning.

24.   On paragraph 20(d) above, the estimated annual expenditure of $100,000 is for acquisition of consumables such as backup tapes and printer toners.

25.   On paragraph 20(e) above, the estimated annual expenditure of $22,000 is for rental of communication data lines.

26.   The estimated recurrent expenditure of $8,289,000 will be partly offset by the annual savings of $1,157,000 being the running costs currently incurred in the existing system. The estimated additional recurrent expenditure arising from the proposed system is therefore $7,132,000 per annum and will be absorbed within existing resources.

IMPLEMENTATION PLAN

27.   Our plan is to implement CAPFIS fully by September 2008. The proposed implementation plan is as follows –

Activity	Target completion date
Tendering for the supply of hardware, software and implementation services	March 2006
System implementation for the replacement of existing CAFIS	February 2007
Data conversion	February 2007
Replacement of existing CAFIS	March 2007
System implementation of the additional functions and interfaces with other Force computer systems	February 2008
Roll-out of the additional functions and interfaces with other Force computer systems	March 2008
System nursing	September 2008

OTHER PROPOSALS CONSIDERED

28.   Apart from replacing CAFIS with a new system, CP has also considered the option of expanding the hardware capacity of CAFIS to accommodate the continuous growth of the fingerprint database. However, as mentioned in paragraph 5, the sole supplier for the necessary hardware for upgrading the existing system has discontinued production of the hardware. In this regard, the option of a system upgrade is not a feasible one.

BACKGROUND INFORMATION

29.   We consulted the Legislative Council Panel on Security on the proposal on 15 April 2005. Members were generally supportive of the proposal. They raised a few questions, in relation to the retention and removal of fingerprint data from CAPFIS, release of data to overseas LEAs and disposal strategy of the old hardware system and records of CAFIS when CAPFIS came into place. We responded to Members' questions at the Panel meeting and via a set of supplementary information circulated to Members after the meeting. A summary of the Administration's response is set out below –

>   (a)   In accordance with the law and established guiding principles, the HKPF will retain the fingerprint and palmprint records of persons convicted of or arrested for certain offences, juveniles cautioned under the Police Superintendent's Discretion Scheme, and persons who are subject of removal orders under the Immigration Ordinance.

>   (b)   Records of certain categories of persons will be weeded in accordance with the respective sets of conditions, including persons found not guilty, unconditionally released or released without charge.

>   (c)   Release of data to overseas authorities will be done in compliance with the Personal Data (Privacy) Ordinance.

>   (d)   Measures will be in place for the disposal of records and hardware of CAFIS. Specifically the HKPF will erase all data by degaussing, which will ensure that the data will be unrecoverable and any hard disk erased will not function afterwards. HKPF will liaise with the contractor to dispose of the old equipment in compliance with applicable environmental legislation and regulations.

Security Bureau
May 2005

Cost and Benefit Analysis for the Computer Assisted Palmprint and Fingerprint Identification System

	Cash flow ($'000)							
	2005-06	**2006-07**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**Total**
Cost								
Non-Recurrent								
- Expenditure	472	29,552	29,552	-	-	-	-	59,576
Sub-total	472	29,552	29,552	-	-	-	-	59,576
Recurrent								
- Expenditure[Note 1]	-	-	-	8,289	8,289	8,289	8,289	33,156
Sub-total	-	-	-	8,289	8,289	8,289	8,289	33,156
Total cost	**472**	**29,552**	**29,552**	**8,289**	**8,289**	**8,289**	**8,289**	**92,732**
Savings								
Realisable savings [Note 1]	-	-	-	1,157	1,157	1,157	1,157	4,628
Total savings	**-**	**-**	**-**	**1,157**	**1,157**	**1,157**	**1,157**	**4,628**
Net Shortfall	**472**	**29,552**	**29,552**	**7,132**	**7,132**	**7,132**	**7,132**	**88,104**
Net Cumulative Shortfall[Notes 2 & 3]	**472**	**30,024**	**59,576**	**66,708**	**73,840**	**80,972**	**88,104**	

Note 1   The proposed replacement system is meant to be cost-neutral in terms of staffing requirements.　Hence, the analysis does not cover these cost items.

Note 2   The project is recommended despite the net cumulative shortfall for the following reasons –

(a)   The existing system will not be able to accept new fingerprints without removing old records upon reaching its maximum capacity in 2008. This will lead to unreliable matching results and is totally unacceptable from the law enforcement and criminal justice point of view.

(b)   The proposed replacement will have a number of benefits/improvement as stated in paragraphs 7 – 10 of FCR(2005-06)10.　This will better meet the law enforcement agencies' operational requirements.

Note 3   About $4 million was generated as revenue in 2003-04 under the existing system for the issue of the Certificates of No Criminal Conviction. The revenue to be generated from the proposed system will depend on the result of the costing exercise.

Notional savings arising from the implementation of CAPFIS and its re-deployment

	Work process which brings about the savings	Manpower involved (no. of post)		Savings $'000
(a)	Improvement in screen switching	PC[Note 1]	0.86	302
(b)	Improvement in the highlighting process	PC	1.60	563
(c)	Lifting the requirement of demographic input for all court arrest cases	PC CA[Note 2]	0.29 0.64	242
(d)	Savings from manual dissemination of identification results and manual case handling	PC CA Typist	0.02 0.17 0.26	103
	Total:	**PC** **CA** **Typist**	**2.77** **0.81** **0.26**	**1,210**

	Work process which requires additional manpower	Manpower required (no. of post)		Staff costs $'000
(e)	Keeping multiple image of tenprints	PC	0.71	250
(f)	New palmprint services			
	• Input/Registering of Palmprint	PC	0.88	310
	• Search & verification of identity by using palmprint due to poor quality of the fingerprint	PC	0.69	243
	• Search & verification of latent palmprint against recorded palmprint database	PC	1.64	577
	Total:	**PC**	**3.92**	**1,380**

Note 1 : PC – Police Constable
Note 2 : CA – Clerical Assistant