ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND Hong Kong Police Force

HEAD 710 – COMPUTERISATION

New Subhead "Replacement and Upgrade of the Information Technology Infrastructure and Applications of the Hong Kong Police Force"

HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

New Subhead "Replacement of the Command and Control Communications System of the Hong Kong Police Force"

Members are invited to approve the following two new commitments for the Hong Kong Police Force –

- (a) \$396,823,000 under Head 710 for the replacement and upgrade of the information technology infrastructure and applications; and
- (b) \$855,436,000 under Head 708 for the replacement of the Command and Control Communications System

PROBLEM

To maintain its vital routine operation and 999 emergency services, the Hong Kong Police Force (HKPF) needs to replace and upgrade the ageing hardware and software of its current information technology (IT) infrastructure and applications; and to replace the Command and Control Communications System which is approaching the end of its serviceable life from 2019 onwards.

/PROPOSALS

2. The Commissioner of Police, with the support of the Secretary for Security and the Government Chief Information Officer, proposes to –

- (a) replace and upgrade the IT infrastructure and applications at an estimated cost of \$396,823,000; and
- (b) replace the Command and Control Communications System at an estimated cost of \$855,436,000.

Encls. 1 & 2 3. Details of the above two funding proposals are at Enclosures 1 and 2 respectively.

CONSIDERATIONS

4. The HKPF completed a strategy review on its information and communications technology systems in 2014. The review report proposed that HKPF should replace obsolete hardware and software of its IT and communications infrastructure; and enhance its processing capability with a view to maintaining HKPF's vital routine operation in future and strengthening its services to the public.

5. The IT infrastructure and applications of HKPF refer to a combined set of hardware, software and networks which support the vital routine operation of HKPF. HKPF proposes to replace and upgrade 17 different IT infrastructure and applications. Amongst these items, certain hardware and software of 12 items have already reached or will reach the end of serviceable life by 2020 at the latest, while the remaining five items involve upgrading existing infrastructure or establishing new systems to meet current and future needs.

6. Separately, the Third Generation Command and Control Communications System (CC3 System), which supports HKPF in answering and responding to 999 emergency calls, has been in use since 2004. The manufacturers will cease supporting some of the major components of the CC3 System from 2019 onwards and hence HKPF plans to upgrade the CC3 System to the Fourth Generation Command and Control Communications System (CC4 System).

7. The replacement and upgrade of HKPF's IT infrastructure and applications and the replacement of the CC3 System are both time-critical and inter-related. The requirements of the CC4 System on data processing speed and

capacity, software and hardware interfacing as well as system security, etc., cannot be met by the current IT infrastructure of HKPF. The CC4 System will need to operate on the upgraded IT infrastructure proposed in Enclosure 1. Accordingly, funding for the two has to be sought as a package.

PUBLIC CONSULTATION

8. We consulted the Legislative Council Panel on Security on the two proposals on 1 March 2016. Members supported in principle the Government's submission of the proposals to the Finance Committee for funding approval.

Security Bureau April 2016

Replacement and Upgrade of the Information Technology (IT) Infrastructure and Applications of the Hong Kong Police Force (\$396,823,000)

BACKGROUND

The IT infrastructure and applications of the Hong Kong Police Force (HKPF) provide the necessary day-to-day IT support to ensure the provision of essential, high quality and reliable services to the public. These include, for example, network connection for computers in police stations; data transmission for Police facilities at various locations in Hong Kong; operating platform, data storage and data exchange for different computer systems of HKPF; as well as operation of HKPF's internal computer systems, such as intranet and accounting management system, etc.

NEED FOR REPLACEMENT AND UPGRADE

2. Given the continued ageing of certain hardware and software of its IT infrastructure and applications with the earliest ones operating since 1990, HKPF proposes to replace and upgrade a total of 17 different infrastructure and applications. Of these, 12 (i.e. items 1-5, 7, 9-10, 13-16 in the table below) involve replacement of obsolete hardware and software which will reach the end of serviceable life by 2020 at the latest. The remaining five items (i.e. items 6, 8, 11-12, 17 in the table below) involve upgrading existing infrastructure or establishing new systems to meet HKPF's future operational needs, enhance efficiency and improve services to the public. These 17 items as divided by four categories are summarised below –

Category		Infrastructure and Applications		Major Reasons
A. Replacement and upgrade of IT	1.	New Data Centre		Expansion of data centre given the existing capacity will reach its limit by 2018.
infrastructure	2.	Police Data Network		Replacement of obsolete hardware
	3.	Shared Server Environments	(a)	Replacement of obsolete software
			(b)	Improvement in allocation of computing resources and system management

	Category	Infrastructure and Applications	Major Reasons
		4. Hong Kong Police Access Control	(a) Replacement of obsolete hardware and software
			(b) Improvement in access management
		5. Police Intranet	Replacement of obsolete hardware and software
		 Mobile Device Management and Hong Kong Police Message 	Upgrade of infrastructure
		7. Help-Desk Problem Tracking System and	(a) Replacement of obsolete software
		Manager of Managers	(b) Improvement in system monitoring and management
В.	Replacement and upgrade of data storage	8. Data Interoperability	Improvement in data exchange, storage and management
	systems	9. Hong Kong Police Geographic Information System	Replacement of obsolete hardware and software
		10. Hong Kong Police Photo Album Library	Replacement of obsolete hardware and software
		11. Hong Kong Police Photo Repository	Establishment of a new centralised database for crime-related photos to facilitate case investigation
		12. Strategic Reporting Solution	Establishment of a new system to enhance efficiency of data analysis
C.	Replacement and upgrade of internal	13. Accounting and Financial Management System	Replacement of obsolete hardware and software
	management systems	14. Occupational Safety and Health Risk Management System	Replacement of obsolete hardware and software

Category	Infrastructure and Applications	Major Reasons
D. Enhancement of services to the public	15. Hong Kong Police Licensing System	 (a) Replacement of obsolete hardware and software (b) Upgrade of system to enable the public to apply for
	16 Community	licences via the Internet
	Engagement System	hardware and software
		 (b) Upgrade of system to enable the public to apply for membership of Junior Police Call and Senior Police Call as well as to enrol in relevant activities via the Internet
	17. Online Booking System for Certificate of No Criminal Conviction, Criminal Conviction Data Request and Sexual Conviction Record Check	Establishment of a new system to enable the public to make online bookings

3. Detailed justifications and benefits of implementing the aforesaid projects are elaborated in the ensuing paragraphs.

A. Replacement and upgrade of IT infrastructure (estimated cost: \$270,189,000)

4. The IT infrastructure of HKPF refers to a combined set of hardware, software and networks which support the operation of HKPF's IT application systems. Data centres housing the IT equipment are part of this IT infrastructure. Currently, HKPF operates three data centres^{Note} which have been in operation for over 25 years. The space of these centres is limited and the equipment has become increasingly obsolete. In addition, the data centres in Kowloon and the New Territories, both operating since 1990, will reach their capacity ceilings in 2018.

5. To cope with the ever-increasing service needs and tie in with other new computer systems (such as the Fourth Generation Command and Control Communications System mentioned in Enclosure 2), HKPF plans to expand its data

^{Note} The three data centres are located on the Hong Kong Island, in Kowloon and in the New Territories.

centres and increase the overall data processing capacity. HKPF will establish a new data centre in a government data centre complex under planning by the Office of the Government Chief Information Officer. The new data centre is scheduled for commissioning in 2020. Once the new data centre in the complex has commenced operation, HKPF will close its data centre in Kowloon, which has the smallest data processing capacity, and migrate some IT equipment from the data centres in Kowloon and the New Territories to the new data centre. In the meantime, HKPF will carry out mid-term improvement works to ensure that these two existing data centres will be able to operate until the commissioning of the new data centre. HKPF will continue to maintain, in the long run, three data centres in order to ensure the stability and security of its IT applications.

6. Separately, since HKPF's network equipment and software have been in use for many years, the overall structural design is obsolete and many major components have already reached the end of serviceable life. It is difficult to purchase spare parts in the market. For example, most of HKPF's network equipment has been in service for 11 to 16 years, while the servers for access control systems and the operating system of Police Intranet have already exceeded the end of serviceable life. There is an imminent need for replacing and upgrading the network equipment and software to minimise the risk of system failure.

7. While upgrading its IT infrastructure, HKPF also plans to enhance its mobile device management and instant messaging system as well as adopt the latest technology in order to enhance efficiency and system security. Moreover, HKPF will enhance shared server environments to provide standardised platforms for different IT application systems, thereby achieving better allocation of computing resources and improvement in system management.

8. The above-mentioned replacement and upgrade of IT infrastructure is expected to bring about the following benefits –

- (a) improved system stability and resilience;
- (b) more secure, reliable and sustainable platform for IT applications systems;
- (c) more efficient and effective sharing of resources;
- (d) reduced lead time to deploy new services and applications;
- (e) better management of network and server systems; and
- (f) improved access control and data protection.

B. Replacement and upgrade of data storage systems (estimated cost: \$65,420,000)

9. At present, data frequently used by HKPF, such as information on cases and the persons involved, data of the Geographic Information System, photos, financial information, as well as accounting and inventory information, etc. are stored in and managed through different application systems. Specific and diverse data interfaces have to be developed for different application systems to exchange data, giving rise to efficiency problems with data management, standards and reporting.

10. HKPF plans to establish a central data management platform to enhance data interoperability so that data of major application systems related to police operations and internal management can be exchanged in a centralised, reliable and secure manner. By centrally managing data and standardising data interfaces, the processing and analysis of data across various systems will become easier and faster with strengthened data security levels, resulting in more effective deployment of human resources.

11. HKPF's applications for processing geographic information and photos are fast becoming obsolete and are in need of replacement. The Geographic Information System provides key locational information to frontline police officers for performing operations such as emergency rescue, routine patrol and traffic The Photo Album Library facilitates Police's criminal management, etc. investigation, enabling victims and crime witnesses to identify culprits via photos. If these application systems are not upgraded in a timely manner, HKPF's vital routine work, operations and criminal investigation will be affected. Also, HKPF plans to establish a digital photo repository to replace the existing manual system for storing and managing case-related photos, such as photos of exhibits and crime scenes, to enable quick and comprehensive search by frontline officers for This would help streamline the current investigation and management. labour-intensive workflow for image-handling, such as transmission, photo development and record maintenance, thereby improving the utilisation of manpower and resources.

C. Replacement and upgrade of internal management systems (estimated cost: \$16,051,000)

12. HKPF's Accounting and Financial Management (AFM) System and Occupational Safety and Health Risk Management System have been in use for many years and suppliers have started to terminate support services for certain software. 13. The AFM is a critical system in HKPF for performing core accounting and financial activities, such as procurement, funding control, payment and financial reporting. In case of system failure, HKPF would face a high risk of not being able to settle payments before due dates and might hence have to pay surcharges for late payments. It is therefore important to replace and upgrade the AFM.

14. To safeguard occupational safety and health (OSH) of HKPF's employees, HKPF has developed the OSH Risk Management System for managing safety risk assessments, OSH incidents and related control measures. In case of system failure, employees might be exposed to significant safety and health risks as HKPF would not be able to conduct the necessary risk assessments, report and follow up on OSH incidents, as well as maintain relevant information. There is an urgent need for this application system to be upgraded as soon as possible.

D. Enhancement of services to the public (estimated cost: \$45,163,000)

15. This proposal involves three systems which provide direct services to the public, namely upgrade of the Hong Kong Police Licensing System and Community Engagement System, as well as establishment of an On-line Booking System for Certificate of No Criminal Conviction, Criminal Conviction Data Request and Sexual Conviction Record Check.

16. Due to existing system constraints, on-line application service is currently not available for various permits and licences such as Security Personnel Permits, temporary liquor license, society registration, arms licence, etc., as well as participation in Junior Police Call and Senior Police Call. HKPF also needs to spend a lot of manpower and resources on clerical and data entry duties required for managing the manual application procedures.

17. To provide more convenient services to the public, shorten processing time and optimise the use of resources, HKPF plans to make available round-the-clock on-line services for applications for the above-mentioned permits and licences; appointments in respect of Certificates of No Criminal Conviction, Criminal Conviction Data Request and Sexual Conviction Record Check; and applications for Junior Police Call and Senior Police Call membership, enrolment in relevant activities and management of personal profile and records.

18. It is estimated that the upgraded infrastructure and applications will be commissioned in stages from the fourth quarter of 2016 to the fourth quarter of 2022.

FINANCIAL IMPLICATIONS

Capital expenditure

19. It is estimated that the capital cost of the replacement and upgrade of the IT infrastructure and applications of HKPF will be \$396,823,000, with breakdown as follows –

		\$'000
(a)	Hardware	140,443
(b)	Software	44,441
(c)	Communications network	8,102
(d)	System implementation services	61,385
(e)	Contract staff	79,719
(f)	Site preparation	9,481
(g)	Training	100
(h)	Consumables	39
(i)	Others	17,043
(j)	Contingency	36,070
	Total	396,823

20. On paragraph 19 (a) above, the estimate of \$140,443,000 is for the acquisition of computer hardware, including network devices (such as firewalls, routers, gateways and proxies), servers, switches, storage systems, security devices, backup and recovery equipment (such as tape libraries and redundancy), and equipment including notebook computers and printers, etc.

21. On paragraph 19 (b) above, the estimate of \$44,441,000 is for the acquisition of computer software, including operating systems, virtualisation software, mobile device management system software, middleware, centralised data repository, database management software, enterprise system management software, back-up and recovery software, etc.

22. On paragraph 19 (c) above, the estimate of \$8,102,000 is for the acquisition of network equipment and related services for the installation and upgrading of data lines connecting various offices of HKPF to the data network.

23. On paragraph 19 (d) above, the estimate of \$61,385,000 is for acquiring system implementation services, including design of new data centre, system analysis and design; developing and installing IT infrastructure and applications; as well as conducting Privacy Impact Assessments and Security Risk Assessments and Audits.

24. On paragraph 19 (e) above, the estimate of \$79,719,000 is for hiring contract staff to provide project management services, system integration and infrastructure implementation, applications development and implementation, and quality assurance.

25. On paragraph 19 (f) above, the estimate of \$9,481,000 is for site preparation and cabling work for the new IT infrastructure and applications.

26. On paragraph 19 (g) above, the estimate of \$100,000 is for the provision of training to users of the new initiatives.

27. On paragraph 19 (h) above, the estimate of \$39,000 is for the acquisition of server back-up tapes and cleaning cartridges for tape libraries.

28. On paragraph 19 (i) above, the estimate of \$17,043,000 is for the relocation of cabinets, computer applications and communications equipment to the new data centre.

29. On paragraph 19 (j) above, the estimate of \$36,070,000 represents a 10% contingency on the total cost of items 19 (a) to (i).

30. The estimated cash flow requirements are as follows –

Financial Year	\$'000
2016 - 17	71,947
2017 - 18	122,385
2018 - 19	53,679
2019 - 20	58,529
2020 - 21	76,666
2021 - 22	13,617
Total	396,823

Other non-recurrent expenditure

31. Replacement and upgrade of the IT infrastructure and applications will entail a total non-recurrent staff cost of \$29,986,000 for project management; procurement of hardware, software and services; site preparation; installation support; security risk assessment and audit; system/user acceptance tests; and implementation support. The cost represents a total of 162.5 man-months of disciplined staff and 248 man-months of civilian grade officers including IT grade staff. Such requirement will be reflected in the estimates of the relevant years.

Recurrent expenditure

32. It is estimated that the annual recurrent expenditure arising from this project will be \$10,838,000 in 2017-18 and will progressively increase to \$50,070,000 from 2021-22 onwards. This expenditure covers the costs of hardware and software maintenance, on-going support services, communications network, consumables and others. Such requirement will be reflected in the estimates of the relevant years.

ANTICIPATED BENEFITS OF THE PROPOSAL

33. It is estimated that the implementation of the proposal will bring about the following cost savings and avoidance –

- (a) realisable savings of \$10,579,000, including \$10,035,000 in maintaining the outdated IT infrastructure and applications and \$544,000 on consumables from 2021-22 onwards. These savings include the maintenance costs of the existing systems to be phased out and that of the obsolete components of existing systems to be upgraded;
- (b) notional recurrent savings of \$18,988,000 from 2023-24 onwards, including \$18,695,000 in staff effort as a result of improved operational efficiency for information and communications technology; and supporting staff and \$293,000 in maintaining obsolete shared server equipment;
- (c) non-recurrent cost avoidance of \$340,112,000 that would otherwise be incurred for adopting the current silo approach for the proposed applications sitting on shared server environments; and
- (d) cost avoidance of \$51,017,000 per annum from 2019-20 onwards, being the recurrent cost that would otherwise be incurred for maintaining the applications mentioned in (c) above.

Appendix 1A 34. A cost and benefit analysis for the proposal is at Appendix 1A.

IMPLEMENTATION SCHEDULE

35. As this project covers 17 items, it will be implemented by phases according to the schedule of individual items. If funding approval can be obtained within the second quarter of 2016, the project is expected for full completion by October 2022. The implementation schedule is as follows –

Activity	Target timing
Procurement of hardware, software and services	May 2016 to July 2020
System analysis, design, development and installation	August 2016 to March 2022
Data conversion	February 2017 to April 2020
User acceptance test and commissioning	October 2016 to April 2021
Migration of application systems to new data centre	October 2020 to October 2022

36.The detailed implementation schedule of the above proposal is atAppendix 1BAppendix 1B.

Appendix 1A

Cost and Benefit Analysis

Replacement and Upgrade of the Information Technology Infrastructure and Applications of the Hong Kong Police Force

	2016-17	2017-18	2018-19	2019-20	2020-21 (\$'000)	2021-22	2022-23	2023-24	Total
Cost of the proposal									
Capital Expenditure	71,947	122,385	53,679	58,529	76,666	13,617	-	-	396,823
Non-recurrent Staff cost	6,774	10,366	7,441	4,470	790	145	-	-	29,986
Sub-total	78,721	132,751	61,120	62,999	77,456	13,762	-	-	426,809
Recurrent Expenditure	-	10,838	19,297	30,722	35,231	50,070	50,070	50,070	246,298
Recurrent Staff cost	-	249	1,838	2,261	2,261	3,066	3,066	3,066	15,807
Sub-total	-	11,087	21,135	32,983	37,492	53,136	53,136	53,136	262,105
(A) Total cost	78,721	143,838	82,255	95,982	114,948	66,898	53,136	53,136	688,914
Savings and cost avoidance									
Non-recurrent									
Cost avoidance	-	-	-	340,112	-	-	-	-	340,112
Sub-total	-	-	-	340,112	-	-	-	-	340,112
Recurrent									
Realisable savings	-	857	883	3,452	4,561	10,579	10,579	10,579	41,490
Notional savings	-	25	3,527	17,337	17,337	18,482	18,482	18,988	94,178
Cost avoidance	-	-	-	51,017	51,017	51,017	51,017	51,017	255,085
Sub-total	-	882	4,410	71,806	72,915	80,078	80,078	80,584	390,753
(B) Total savings	-	882	4,410	411,918	72,915	80,078	80,078	80,584	730,865
(C) Net cost (+) / net savings (-)									
$(\mathbf{C}) = (\mathbf{A}) - (\mathbf{B})$	78,721	142,956	77,845	-315,936	42,033	-13,180	-26,942	-27,448	-41,951
Net cumulative cost / savings	78,721	221,677	299,522	-16,414	25,619	12,439	-14,503	-41,951	

更換及提升香港警務處資訊科技基建設施及應用系統

Replacement and Upgrade of the Information Technology Infrastructure and Applications of the Hong Kong Police Force

詳細預計推行時間表

Estimated Detailed Implementation Schedule

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule								
Projects	2016	2017	2018	2019	2020	2021	2022		
 新数據中心 New Data Centre - 購置硬件、軟件和服務 Procurement of hardware, software and services - 系統分析、設計、開發和裝設 System analysis, design, development and installation - 數據轉換 Data conversion - 遷移應用系統到新數據中心 Migration of applications to new data centre 									
 警察數據網絡 Police Data Network 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 									
 共用伺服器環境 Shared Server Environments - 購置硬件、軟件和服務 Procurement of hardware, software and services - 系統分析、設計、開發和裝設 System analysis, design, development and installation - 數據轉換 Data conversion - 用戶驗收測試和投入運作 User acceptance test and commissioning 									

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule								
Projects	2016	2017	2018	2019	2020	2021	2022		
	1 2 3 4 5 6 7 8 9 10 11 13	2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12		
Hong Kong Police Access Control									
- 購置硬件、軟件和服務 Procurement of hardware, software and services									
- 系統分析、設計、開發和裝設 System analysis, design, development and installation									
- 數據轉換 Data conversion									
- 用戶驗收測試和投入運作 User acceptance test and commissioning		-							
警隊內聯網 Police Intranet									
- 購置硬件、軟件和服務 Procurement of hardware, software and services									
- 系統分析、設計、開發和裝設 System analysis, design, development and installation									
- 數據轉換 Data conversion									
- 用戶驗收測試和投入運作 User acceptance test and commissioning									
流動裝置管理及警隊訊息系統 Mobile Device Management and Hong Kong Police Message									
- 購置硬件、軟件和服務 Procurement of hardware, software and services									
- 系統分析、設計、開發和裝設 System analysis, design, development and installation									
- 數據轉換 Data conversion									
- 用戶驗收測試和投入運作 User acceptance test and commissioning		-							
求助台問題處理系統及電腦通訊系統的進階網路管理 Help-Desk Problem Tracking System and Manager of Managers									
- 購置硬件、軟件和服務 Procurement of hardware, software and services									
- 系統分析、設計、開發和裝設 System analysis, design, development and installation									
- 數據轉換									
Data conversion									
- 用戶驗收測試和投入運作 User acceptance test and commissioning									

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule								
Projects	2016	2017	2018	2019	2020	2021	2022		
 系統數據互用性 Data Interoperability 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 				2 1 2 3 4 5 6 7 8 9 10 11 1	2 1 2 3 4 5 6 7 8 9 10 111	2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12		
- 用戶驗收測試和投入運作 User acceptance test and commissioning									
 警隊地理訊息系統 Hong Kong Police Geographic Information System 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 									
 警察電腦相簿系統 Hong Kong Police Photo Album Library - 購置硬件、軟件和服務 Procurement of hardware, software and services - 系統分析、設計、開發和裝設 System analysis, design, development and installation - 數據轉換 Data conversion - 用戶驗收測試和投入運作 User acceptance test and commissioning 									
 警察數據相片資料庫 Hong Kong Police Photo Repository - 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 									

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule								
Projects	2016	2017	2018	2019	2020	2021	2022		
 策略報表系統 Strategic Reporting Solution 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 		2 1 2 3 4 5 6 7 8 9 10 11 12		2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 111	2 1 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12		
User acceptance test and commissioning 會計及財務管理系統 Accounting and Financial Management System - 購置硬件、軟件和服務 Procurement of hardware, software and services - 系統分析、設計、開發和裝設 System analysis, design, development and installation - 數據轉換 Data conversion - 用戶驗收測試和投入運作 User acceptance test and commissioning									
 職安健安全風險管理系統 Occupational Safety and Health Risk Management System 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 	_								
 警務處牌照系統 Hong Kong Police Licensing System - 購置硬件、軟件和服務 Procurement of hardware, software and services - 系統分析、設計、開發和裝設 System analysis, design, development and installation - 數據轉換 Data conversion - 用戶驗收測試和投入運作 User acceptance test and commissioning 									

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule								
Projects	2016	2017	2018	2019	2020	2021	2022		
 社區参與系統 Community Engagement System 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 					11211210202				
 material and commissioning 無犯罪紀錄證明書、刑事定罪紀錄資料查核及性罪行定罪紀錄查核 網上預約系統 Online Booking System for Certificate of No Criminal Conviction, Criminal Conviction Data Request and Sexual Conviction Record Check 購置硬件、軟件和服務 Procurement of hardware, software and services 系統分析、設計、開發和裝設 System analysis, design, development and installation 數據轉換 Data conversion 用戶驗收測試和投入運作 User acceptance test and commissioning 									

Replacement of the Command and Control Communications System of the Hong Kong Police Force (\$855,436,000)

BACKGROUND

The Third Generation Command and Control Communications System (CC3 System) of the Hong Kong Police Force (HKPF) has been in operation since 2004. It supports HKPF in answering and responding to 999 emergency calls. The 999 emergency hotline is answered by HKPF's three Regional Command and Control Centres (RCCCs) round-the-clock. Upon receipt of a 999 emergency call, the RCCCs will, via the Command and Control Communications System, immediately deploy officers to the scene and liaise with other relevant departments such as the Fire Services Department (FSD). In 2015, the RCCCs answered about 2.18 million 999 calls and over 90% were answered within nine seconds. There were approximately 91 000 emergency cases requiring police assistance.

2. HKPF always strives to respond to all 999 emergency calls within the performance pledge of nine minutes on the Hong Kong Island and Kowloon, and 15 minutes in the New Territories. The response time is measured from the receipt of a report by a RCCC 999 console until arrival of police officers at the scene. In 2015, 99% of the emergency cases were attended to within the pledged response time.

3. The CC3 System comprises the 999 Emergency Telephone System (ETS), Computer-assisted Command and Control System (CACCS) and Integrated Communications System (ICS). The ETS handles all 999 calls and supports police operators to route emergency calls to FSD operators directly. The CACCS is a computer-assisted despatch system which enables rapid and effective deployment of police resources to the scene. With system interface with the Police Operational Nominal Index Computer System, the Transport Department's Vehicle and Driver Licensing Integrated Data System and the Immigration Department's Registration of Persons System, the CACCS provides information on wanted persons, missing persons and suspicious vehicles, etc., which is vital to daily law enforcement duties. The ICS comprises beat radios, microwave links, radio repeaters, antenna equipment and radio despatch workstations, etc. It transmits voice communications between the RCCCs and frontline officers.

NEED FOR REPLACEMENT

Obsolete hardware and software

4. The CC3 System has been in use for more than 11 years. The manufacturers will cease supporting some of its major components from 2019 onwards. In addition, some of the major components have shown signs of ageing, while certain hardware and software have already become obsolete. HKPF therefore has to develop the next-generation Command and Control Communications System in order to ensure that it can continue to reliably handle 999 calls and respond to emergency incidents which may affect the personal safety of members of the public.

5. The ETS, CACCS and ICS under the CC3 System comprise various sub-systems with interlinked components and many complicated system interfaces. Replacing only those hardware which have or will become out of production may result in interfacing and compatibility issues between new and old parts, thus affecting the stability and reliability of the entire system as well as HKPF's capability in handling emergency incidents. Moreover, the CC3 System has been in operation for many years. Its technology may not be able to support new models of parts to deliver their new functions, hence not utilising the new parts at their best and not deploying resources to their most effective use.

6. For system maintenance, as certain hardware have already become obsolete or even out of production and the software design is outdated, the manufacturers have stated that they are not able to continue providing the maintenance and support services for certain major hardware and software. As such, HKPF is currently relying mainly on third party vendors to provide maintenance services, which will also expire from 2020 onwards. Prolonged use of outdated technology will threaten system stability. Further extension of maintenance services contracts is therefore considered undesirable, as it may affect HKPF's capability of responding to emergency incidents.

7. Taking the ICS under the Command and Control Communications System as an example, the major hardware of its two major components (i.e. microwave links and beat radios) is in need of replacement since it is out of production and the manufacturers are not able to continue providing maintenance services. The ICS plays a key role in handling emergency incidents. Upon receiving each 999 call, the RCCCs rely on the ICS to deploy police resources to the scene to handle emergency incidents. Any system failure leading to delayed arrival of police officers at the scene, or even rendering officers unable to arrive at the scene, will delay emergency rescue with possibly disastrous results. As regards other equipment under the ICS such as radio repeaters, antenna equipment and radio despatch workstations, etc., they are still functioning properly and thus need not be replaced.

Fourth Generation Command and Control Communications System

8. In the light of the foregoing, HKPF plans to upgrade the current CC3 System to a fourth generation system. The Fourth Generation Command and Control Communications System (CC4 System) is estimated to be commissioned in stages from the second quarter of 2019 to the third quarter of 2021. The CC4 System will be equipped with the latest hardware, thereby reducing the risk of hardware breakdown and ensuring system stability and reliability. In addition, HKPF will adopt the latest software to enhance system security. After upgrading to the fourth generation, the Command and Control Communications System will provide a more reliable operating environment to ensure HKPF can continue to effectively handle 999 calls and emergency incidents.

Enhancing capability of responding to emergencies

9. The CC4 System will further strengthen HKPF's capability in responding to emergency incidents. The new system will provide the technological capability to extend the coverage of the current function of automatically identifying the location of 999 callers to all local fixed-line and mobile phone users. In future, once related arrangements are in place, in the event that a 999 operator is unable to obtain the address of the scene from a 999 caller, the 999 operator would be able to utilise this technological capability to retrieve corresponding information on the location of the caller and rapidly deploy police resources to the scene, thereby losing no time in rescue operations and enhancing the Police's operational capability and efficiency. Besides, the CC4 System can transmit multimedia information including pictures and video clips provided by the public, such as photos of missing persons, to frontline police officers via the RCCCs. This will be more effective when compared to the current practice of using only verbal description or hard copy of photos.

10. The CC4 System will also be able to transmit information related to the location of incidents, such as previous crime cases including domestic violence, from HKPF's case database to police officers proceeding to the scene. This allows officers to make better preparation and deployment, thereby protecting the lives and property of members of the public. Lastly, the new beat radio models would be of better quality, clearer and more stable in reception, as well as more compact in size. Some models would also integrate with body-worn video cameras to strengthen HKPF's capability in gathering evidence.

11. The CC4 System is a new system and must be based on the upgraded IT infrastructure mentioned in Enclosure 1 as well as connected with other police computer systems through it. In particular, the servers and databases of the CC4 System will be installed in the new data centre mentioned in Enclosure 1 with a view to standardising the operation and security management of various police computer systems. In this regard, replacing and upgrading HKPF's IT infrastructure is a prerequisite for the commissioning of the CC4 System.

FINANCIAL IMPLICATIONS

Capital expenditure

12. It is estimated that the capital cost of the replacement of the Command and Control Communications System will be \$855,436,000, with breakdown as follows –

	(\$'000)	
(a) Software and hardware of the ETS	110,193	
(b) Software and hardware of the CACCS	211,091	
(c) Beat radios	97,793	
(d) Microwave links equipment	19,302	
(e) System implementation and support services	258,688	
(f) Project management	65,487	
(g) Communications network	15,115	
(h) Contingency	77,767	
Total	855,436	

13. On paragraph 12 (a) above, the estimate of \$110,193,000 is for the acquisition of hardware and software for the ETS, including modules in the handling of emergency calls, identification of caller locations, media logging, statistical reporting, handling of multimedia and call management.

14. On paragraph 12 (b) above, the estimate of \$211,091,000 is for the acquisition of hardware and software for the CACCS, including servers, operating systems, computer-aided despatch system and terminals.

15. On paragraph 12 (c) above, the estimate of \$97,793,000 is for the acquisition of 7 400 beat radios with the necessary accessories, including batteries and chargers for supporting round-the-clock policing duties. Some beat radio models would also integrate with body worn video cameras to strengthen HKPF's capability in gathering evidence.

16. On paragraph 12 (d) above, the estimate of \$19,302,000 is for the acquisition of microwave equipment for strategic locations across Hong Kong.

17. On paragraph 12 (e) above, the estimate of \$258,688,000 is for the hiring of implementation services including system installation and configuration, integration, testing, site preparation, and migration and decommissioning of existing equipment.

18. On paragraph 12 (f) above, the estimate of \$65,487,000 is for the engagement of contract staff to supplement the in-house project management team during implementation to provide support for in-project planning, procurement, system integration, quality assurance, system acceptance, contract management and overall project management.

19. On paragraph 12 (g) above, the estimate of \$15,115,000 is for the establishment of a dedicated optical fibre network connecting RCCCs with the data centres to ensure high availability of service with good resilience. This will ensure that in case of system failure or overloading at any RCCC, there will still be a seamless service transition.

20. On paragraph 12 (h) above, the estimate of \$77,767,000 represents a 10% contingency on the total cost of items 12 (a) to (g).

21. The estimated cash flow requirements are as follows –

Financial Year	(\$'000)
2016-17	41,898
2017-18	50,476
2018-19	191,832
2019-20	205,488
2020-21	80,393
2021-22	281,130
2022-23	4,219
Total	855,436

Recurrent expenditure

22. It is estimated that the annual recurrent expenditure arising from this project will be \$16,587,000 in 2019-20 and will progressively increase to \$70,422,000 from 2023-24 onwards. This expenditure covers the costs of hardware and software maintenance, on-going support services, consumables, communications network and radio spectrum licence fees. Such requirement will be reflected in the estimates of the relevant years.

ANTICIPATED BENEFITS OF THE PROPOSAL

23. It is estimated that the implementation of the proposal will bring about the following cost savings and avoidance –

- (a) realisable savings of \$37,066,000 in maintaining the outdated CC3 System from 2022-23 onwards. These savings include the maintenance costs of the existing systems to be phased out and that of the obsolete components of existing systems to be upgraded; and
- (b) non-recurrent cost avoidance of \$179,272,000 that would otherwise be incurred for upgrading the obsolete hardware and software of some CC3 System components.
- Appendix 2A 24. A cost and benefit analysis for the proposal is at Appendix 2A.

IMPLEMENTATION SCHEDULE

25. If funding approval is obtained according to schedule, this project is expected for full completion by September 2021. The implementation schedule is as follows –

Activity	Target timing
System analysis and design	May to November 2016
Procurement of hardware, software and services by phases	August 2016 to December 2017
Delivery of equipment by phases	July 2017 to January 2021
Site preparation, installation, acceptance tests, training and system commissioning by phases	July 2017 to September 2021

26. The detailed implementation schedule of the above proposal is at Appendix 2B.

Appendix 2A

Cost and Benefit Analysis

Replacement of the Command and Control Communications System of the Hong Kong Police Force

	2016-17	2017-18	2018-19	2019-20	2020-21 (\$'000)	2021-22	2022-23	2023-24	Total
Cost of the proposal									
Capital Expenditure	41,898	50,476	191,832	205,488	80,393	281,130	4,219	-	855,436
Recurrent Expenditure	-	-	-	16,587	21,936	39,311	55,014	70,422	203,270
(A) Total cost	41,898	50,476	191,832	222,075	102,329	320,441	59,233	70,422	1,058,706
Savings and cost avoidance									
Non-recurrent									
Cost avoidance	-	-	-	179,272	-	-	-	-	179,272
Sub-total	-	-	-	179,272	-	-	-	-	179,272
Recurrent									
Realisable savings	-	-	-	10,842	19,630	32,706	37,066	37,066	137,310
Sub-total	-	-	-	10,842	19,630	32,706	37,066	37,066	137,310
(B) Total savings	-	-	-	190,114	19,630	32,706	37,066	37,066	316,582
(C) Net cost									
$(\mathbf{C}) = (\mathbf{A}) - (\mathbf{B})$	41,898	50,476	191,832	31,961	82,699	287,735	22,167	33,356	742,124
Net cumulative cost	41,898	92,374	284,206	316,167	398,866	686,601	708,768	742,124	

更換香港警務處指揮及控制通訊系統

Replacement of the Command and Control Communications System of the Hong Kong Police Force

詳細預計推行時間表

Estimated Detailed Implementation Schedule

項目	詳細預計推行時間表 Estimated Detailed Implementation Schedule						
Projects	2016	2017	2018	2019	2020	2021	
 求助電話系統 Emergency Telephone System 系統分析和設計 System analysis and design 購置硬件、軟件和服務 Procurement of hardware, software and services 交付設備 			1 2 3 4 5 6 7 8 9 10 11 12	<u>1</u> 2 3 4 5 6 7 8 9 10 11 12	1 2 3 4 5 6 7 8 9 10 11 12	<u>1</u> 2 3 4 5 6 7 8 9 10 11 12	
Delivery of equipment - 場地準備、安裝、驗收測試、訓練和系統啟用 Site preparation, installation, acceptance tests and system commissioning		_					
 指揮及控制電腦系統 Computer-assisted Command and Control System - 系統分析和設計 System analysis and design - 購置硬件、軟件和服務 Procurement of hardware, software and services - 交付設備 Delivery of equipment - 場地準備、安裝、驗收測試、訓練和系統啟用 Site preparation, installation, acceptance tests and system commissioning 							
 綜合無線電通訊系統 - 無線電對講機 Integrated Communications System - Beat Radios 系統分析和設計 System analysis and design 購置硬件、軟件和服務 Procurement of hardware, software and services 交付設備 Delivery of equipment 安裝、驗收測試、訓練和系統啟用 Installation, acceptance tests and system commissioning 	-						
 綜合無線電通訊系統 - 微波鏈路 Integrated Communications System - Microwave Links 系統分析和設計 System analysis and design 購置硬件、軟件和服務 Procurement of hardware, software and services 交付設備 Delivery of equipment 場地準備、安裝、驗收測試、訓練和系統啟用 Site preparation, installation, acceptance tests and system commissioning 	_						