

**For discussion  
on 1 March 2016**

**Legislative Council Panel on Security**

**Replacing and Upgrading the Information Technology Infrastructure  
and Applications of the Hong Kong Police Force and  
Replacement of the Command and Control Communications System of  
the Hong Kong Police Force**

**PURPOSE**

Certain hardware and software of the current information technology (“IT”) infrastructure and applications of the Hong Kong Police Force (“HKPF”) are ageing. The serviceable life of the Command and Control Communications System is also approaching the end from 2019 onwards. These infrastructure and systems are of vital importance for the HKPF to maintain its basic routine operation and 999 emergency services. If the above-mentioned infrastructure and systems are not timely replaced and upgraded, the HKPF’s capability in maintaining the existing level of services and handling emergency incidents will be seriously affected.

2. The HKPF completed a strategy review on its information and communications technology systems in 2014. The review report proposed that the HKPF should replace obsolete hardware and software of its IT and communications infrastructure and enhance the processing capability with a view to ensuring that the HKPF’s routine operation can be maintained in future and strengthening its services to the public. In accordance with this suggestion, the HKPF plans to replace and upgrade its IT infrastructure and applications and replace its Command and Control Communications System. Since these two proposals are inter-related, particularly that the next-generation Command and Control Communications System needs to operate on the upgraded IT infrastructure, this paper consults the Panel on Security on these two proposals together. If Members support the proposals, the HKPF plans to seek funding approval from the Finance Committee via two applications, one under Head 710 “Computerisation” and another under Head 708 “Capital Subventions and Major Systems and Equipment”.

## REPLACING AND UPGRADING THE INFORMATION TECHNOLOGY INFRASTRUCTURE AND APPLICATIONS

### *Background*

3. The IT infrastructure and applications of the HKPF mainly provide the necessary IT support for its basic routine operation, for example, providing 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 the HKPF; as well as maintaining the operation of the HKPF's internal computer systems, such as intranet and accounting management system, etc. The HKPF requires the above-mentioned infrastructure and applications for the provision of essential, high quality and reliable services to the public in this modern era when IT is under rapid development.

4. As certain hardware and software of its IT infrastructure and applications have been ageing, the HKPF proposes to replace and upgrade a total of 17 different infrastructure and applications in 4 categories after detailed planning with a view to maintaining its basic routine operation and enhancing its services to the public –

<b>Category</b>	<b>Infrastructure and Applications</b>	<b>Major Reasons</b>
A. Replacement and upgrade of IT infrastructure	1. New Data Centre	<ul style="list-style-type: none"><li>• Expansion of data centre as the existing capacity will soon reach its limit</li></ul>
	2. Police Data Network	<ul style="list-style-type: none"><li>• Replacement of certain obsolete hardware</li></ul>
	3. Shared Server Environments	<ul style="list-style-type: none"><li>• Replacement of certain obsolete software</li><li>• Improvement in allocation of computing resources and in network management</li></ul>
	4. Hong Kong Police Access Control	<ul style="list-style-type: none"><li>• Replacement of certain obsolete hardware and software</li><li>• Improvement in network management</li></ul>
	5. Police Intranet	<ul style="list-style-type: none"><li>• Replacement of certain obsolete hardware and software</li></ul>

<b>Category</b>	<b>Infrastructure and Applications</b>	<b>Major Reasons</b>
	6. Mobile Device Management and Hong Kong Police Message	<ul style="list-style-type: none"> <li>• Upgrade of the infrastructure of the relevant system</li> </ul>
	7. Help-Desk Problem Tracking System and Manager of Managers	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete software</li> <li>• Improvement in network management of the communications systems</li> </ul>
B. Replacement and upgrade of data storage systems	8. Data Interoperability	<ul style="list-style-type: none"> <li>• Improvement in data exchange, storage and management</li> </ul>
	9. Hong Kong Police Geographic Information System	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> </ul>
	10. Hong Kong Police Photo Album Library	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> </ul>
	11. Hong Kong Police Photo Repository	<ul style="list-style-type: none"> <li>• Establishment of a new centralised database for crime-related photos to facilitate case investigation</li> </ul>
	12. Strategic Reporting Solution	<ul style="list-style-type: none"> <li>• Establishment of a new system to enhance efficiency of data analysis</li> </ul>
C. Replacement and upgrade of internal management systems	13. Accounting and Financial Management System	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> </ul>
	14. Occupational Safety and Health Risk Management System	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> </ul>
D. Enhancing services to the public	15. Hong Kong Police Licensing System	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> <li>• Upgrade of system to enable the public to apply for licences via the Internet</li> </ul>

Category	Infrastructure and Applications	Major Reasons
	16. Community Engagement System	<ul style="list-style-type: none"> <li>• Replacement of certain obsolete hardware and software</li> <li>• Upgrade of system to enable the public to apply for membership of Junior Police Call and Senior Police Call and enrol in relevant activities via the Internet</li> </ul>
	17. Online Booking System for Sexual Conviction Record Check, Certificate of No Criminal Conviction and Criminal Conviction Data Request	<ul style="list-style-type: none"> <li>• Establishment of a new system to enable the public to make online bookings</li> </ul>

*Justifications and Benefits*

5. Amongst the infrastructure and applications listed above, certain hardware and software of 12 items (i.e. items 1-5, 7, 9-10, 13-16) have already reached or will reach the end of serviceable life by 2020 at the latest and are thus in need of replacement, otherwise the stability and reliability of the HKPF's IT systems and even routine operation would be seriously affected. Replacing these infrastructure and systems will enable the HKPF to maintain its current level of services in future. The remaining 5 items (i.e. items 6, 8, 11-12, 17) involve upgrading existing infrastructure or establishing new systems with a view to meeting the HKPF's future operational needs, enhancing efficiency and improving services to the public. Detailed justifications and benefits of implementing the aforesaid projects are elaborated in the ensuing paragraphs.

**A. Replacement and upgrade of IT infrastructure**

6. The three data centres of the HKPF have been in operation for over 25 years. The space of these centres is limited and the equipment has become increasingly obsolete. In addition, two data centres will reach capacity ceiling in 2018. To cope with the ever-increasing service needs and to tie in with other new computer systems (such as the fourth generation

Command and Control Communications System mentioned in later paragraphs), the HKPF plans to expand its data centres in order to increase its overall data processing capacity. The HKPF will establish a new data centre in the data complex in Lai Chi Kok being planned by the Office of the Government Chief Information Officer. The new data centre is scheduled for commissioning starting 2020. Once the new data centre in Lai Chi Kok has commenced operation, the HKPF will close one existing data centre which has the smallest data processing capacity. In the meantime, the HKPF will carry out mid-term improvement works to ensure that the existing data centres which are approaching the capacity ceiling will be able to operate until the commissioning of the new data centre.

7. On the other hand, since the HKPF's network equipment and software have been used for many years, the overall structure design is now obsolete and many major components have already reached the end of serviceable life. In addition, it is difficult to purchase spare parts in the market. For example, most of the 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. If relevant network equipment and software are not replaced and upgraded, the risk of system failure will increase, thereby affecting the stability and reliability of the service as well as routine operation of the HKPF. While upgrading its IT infrastructure, the HKPF will also enhance its mobile device management and instant messaging system as well as adopt the latest technology in order to enhance computing power, efficiency and system security. Moreover, the HKPF will implement shared server environments to provide standardised platform for different application systems, thereby achieving better allocation of computing resources and improvement in network management.

## **B. Replacement and upgrade of data storage systems**

8. Data frequently used by the 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 by different application systems. Specific and diverse data interfaces have to be developed for different application systems to exchange data, leading to issues of data management and standards. At present, each application system will only generate default reports. Whenever there is a need to compile special reports or cross-system reports, a lot of time and manpower have to be spent on manual retrieval and compilation of information from various application systems, and this is not conducive to optimum deployment of human resources. As such, the HKPF

plans to establish a central data management platform to enhance data interoperability so that data stored in different application systems can be exchanged in a centralised, reliable and safe manner. In addition, by adopting the strategic reporting solution, efficiency in data analysis can be enhanced and human resources can be more effectively deployed.

9. On the other hand, the HKPF's applications for processing geographic information and photos have become increasingly 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 management etc. The Photo Album Library facilitates the Police's criminal investigation, enabling victims and crime witnesses to identify culprits via photos. If these application systems are not timely upgraded, the HKPF's routine work, operations and criminal investigation will be affected. Also, the HKPF plans to establish a digital photo repository for storing and managing crime-related photos, such as photos of exhibits and crime scenes, to facilitate case investigation.

### **C. Replacement and upgrade of internal management systems**

10. The HKPF's Accounting and Financial Management 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 operating systems and software. Since these two application systems support the HKPF's routine procurement and expenditure monitoring as well as occupational safety and health risk assessment and incident management respectively, in case of system failure, such departmental routine operation as well as occupational safety and health protection for HKPF employees will be affected. Therefore, there is a need for both application systems to be upgraded as soon as possible.

### **D. Enhancing services to the public**

11. At present, members of the public who wish to apply to the HKPF for Security Personnel Permits, temporary liquor license, society registration and participation in Junior Police Call etc can only download application forms from the Internet or obtain the forms from other sources, and then submit them with supporting documents by mail or in person to designated offices. Due to technical constraints, online application is currently not available for these services. On the other hand, after receiving the written applications, the HKPF also needs to spend a lot of manpower and

resources on clerical and data entry duties, hence necessitating certain time for processing applications.

12. To provide more convenient services to the public, shorten processing time and optimise the use of resources, the HKPF plans to provide electronic services for the public to submit applications for the above-mentioned licences; make appointments in respect of Certificates of No Criminal Conviction, Criminal Conviction Data Request and Sexual Conviction Record Check; and apply for Junior Police Call and Senior Police Call membership as well as enrol in relevant activities. Upon implementation, citizens will be able to make appointments and apply for the above services through the Internet.

13. The HKPF all along strives to provide quality services for all sectors of the community. It is estimated that the upgraded infrastructure and applications will be commissioned in stages from end-2016 to the fourth quarter of 2022.

## **REPLACEMENT OF THE COMMAND AND CONTROL COMMUNICATIONS SYSTEM**

### *Background*

14. The Third Generation Command and Control Communications System (“CC3 System”) of the HKPF has been in operation since 2004. It supports the HKPF in answering and responding to 999 emergency calls. The 999 emergency hotline is answered by the HKPF’s three Regional Command and Control Centres (“RCCCs”) round-the-clock. Upon receipt of a 999 call, if it is an emergency case, the RCCCs will immediately, via the Command and Control Communications System, deploy officers to the scene for handling the case and liaise with other relevant departments such as the Fire Services Department (“FSD”). In 2015, the RCCCs answered about 2.18 million calls and over 90% of them were answered within 9 seconds. There were approximately 91 000 emergency cases requiring police assistance.

15. The HKPF always strives to respond to all 999 emergency calls within the performance pledge of 9 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.

16. 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.

17. Since the CC3 System has been in use for more than 11 years, the support services for its major components will expire from 2019 onwards. In addition, these major components are showing signs of ageing, while certain hardware and software are already obsolete. The 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.

#### *Justifications and Benefits*

18. As mentioned above, the CC3 System has been in operation for more than 11 years. The ETS, CACCS and ICS under the CC3 System comprise various subsystems with interlinked components and many complicated system interfaces. Replacing only those hardware which has 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 the 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 arising from the latest technology, hence not utilising the new parts at their best and not deploying resources to their most effective use.

19. As for system maintenance, as certain hardware is already obsolete or even out of production and the software design is outdated, the manufacturers have stated that they are not able to continue the maintenance and support services for certain major hardware and software. As such, the



HKPF currently mainly relies 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 not desirable, in order not to affect the HKPF's capability in responding to emergency incidents.

20. 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 base radios) is in need of replacement since it is out of production and the manufacturers are not able to continue to provide maintenance services. The ICS plays a key role in handling emergency incidents. Every time a 999 call is received, 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 and the results could be disastrous. As regards other equipment under the ICS such as radio repeaters, antenna equipment and radio dispatch workstations etc, they are currently still functioning properly and thus need not be replaced.

21. In the light of the above, the HKPF plans to upgrade the current CC3 System to a fourth generation system. If funding application is approved by the Legislative Council, in accordance with the current plan, 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, the 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 supporting the Police's delivery of emergency services, thereby ensuring that the HKPF can continue to effectively handle 999 calls and emergency incidents.

22. In addition, the CC4 System will further strengthen the HKPF's capability in responding to emergency incidents. The new system will 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, in the event that a 999 operator is unable to obtain the address of the scene from a 999 caller, the operator would still be able to retrieve from the system information of the relevant location 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 is more effective when compared to the current practice of using only verbal description.

23. On the other hand, the CC4 System will be able to transmit information related to the location of incidents, such as previous crime cases including domestic violence cases, from the 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 are more sensitive, clear and stable in reception. They are also more compact. Some models would also integrate with body worn video cameras to strengthen the HKPF's capability in gathering evidence.

24. The CC4 System is an entirely new system. Its requirements 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 the HKPF. Therefore, the CC4 System must be based on the upgraded IT infrastructure and connect 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 paragraph 6 above with a view to standardising the operation and security management of various police computer systems. In this regard, replacing and upgrading the HKPF's IT infrastructure is a prerequisite for the commissioning of the CC4 System.

## **FINANCIAL IMPLICATIONS**

### ***Non-recurrent expenditure***

25. The HKPF plans to implement the above two proposals in 7 years (from 2016-17 to 2022-23). Replacing and upgrading the IT infrastructure and applications (Head 710) will cost \$396.8 million, while replacement of the Command and Control Communications System (Head 708) will cost \$855.4 million. The breakdowns are as follows –

(A) Head 710: Replacing and Upgrading the Information Technology Infrastructure and Applications of the Hong Kong Police Force

<b>Expenditure breakdown</b>	(HK\$ '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
<b>Total</b>	<b>396,823</b>

The estimated cash flow requirements are as follows –

<b>Year</b>	(HK\$ '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
<b>Total</b>	<b>396,823</b>

(B) Head 708: Replacement of the Command and Control Communications System of the Hong Kong Police Force

<b>Expenditure breakdown</b>	(HK\$ '000)
(a) Software and hardware of the Emergency Telephone System	110,193
(b) Software and hardware of the Computer-assisted Command and Control System	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
<b>Total</b>	<b>855,436</b>

The estimated cash flow requirements are as follows –

<b>Year</b>	(HK\$ '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
<b>Total</b>	<b>855,436</b>

***Other non-recurrent expenditure***

26. In addition, a total non-recurrent staff cost of \$29.99 million will also be incurred by the HKPF for planning, co-ordinating, replacing and upgrading the IT infrastructure and applications. Such requirement will be reflected in the estimates of the relevant years.

***Recurrent expenditure***

27. Replacing and upgrading the IT infrastructure and applications (Head 710) will entail an annual recurrent expenditure of \$50.07 million. On the other hand, the HKPF estimates that an annual recurrent expenditure of \$10.58 million in maintaining the outdated infrastructure and applications can be saved from 2020-21 onwards. Regarding replacement of the Command and Control Communications System (Head 708), it will entail an annual recurrent expenditure of \$70.42 million. Meanwhile, the HKPF estimates that an annual recurrent expenditure of \$37.07 million in maintaining the outdated system can be saved from 2022-23 onwards. Both proposals will not incur additional recurrent staff cost.

28. The detailed breakdown of the recurrent expenditure of the two proposals above are as follows. Such requirement will be reflected in the estimates of the relevant years.

(A) Head 710: Replacing and Upgrading the Information Technology Infrastructure and Applications of the Hong Kong Police Force

	<b>2017-18</b>	<b>2018-19</b>	<b>2019-20</b>	<b>2020-21</b>	<b>2021-22</b>
					<b>(HK\$ '000)</b>
(a) Software and hardware maintenance	8,047	10,769	17,598	19,714	29,362
(b) On-going support services	2,770	4,945	9,440	11,554	12,651
(c) Communications network, consumables and others	21	3,583	3,684	3,963	8,057
<b>Total:</b>	<b>10,838</b>	<b>19,297</b>	<b>30,722</b>	<b>35,231</b>	<b>50,070</b>

(B) Head 708: Replacement of the Command and Control Communications System of the Hong Kong Police Force

	2019-20	2020-21	2021-22	2022-23	2023-24
	(HK\$ '000)				
(a) Software and hardware maintenance	14,344	19,200	23,082	36,995	50,612
(b) On-going support services	100	100	4,458	6,244	8,032
(c) Consumables	7	7	7	11	14
(d) Communications network	138	144	9,279	9,279	9,279
(e) Radio spectrum licence fees	1,998	2,485	2,485	2,485	2,485
<b>Total:</b>	<b>16,587</b>	<b>21,936</b>	<b>39,311</b>	<b>55,014</b>	<b>70,422</b>

## IMPLEMENTATION SCHEDULE

29. We plan to submit two separate funding applications for the above two proposals to the Finance Committee in this legislative year. As each proposal covers many different items, each proposal will be implemented by phases according to the schedule of each item. If funding approval is obtained according to schedule, the proposals are expected for full completion by end-2022. The implementation schedules are as follows –

(A) Head 710: Replacing and Upgrading the Information Technology Infrastructure and Applications of the Hong Kong Police Force

<u>Activity</u>	<u>Estimated Schedule</u>
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

<u>Activity</u>	<u>Estimated Schedule</u>
User acceptance test and commissioning	October 2016 to April 2021
Migration of application systems to new data centre	October 2020 to October 2022

(B) Head 708: Replacement of the Command and Control Communications System of the Hong Kong Police Force

<u>Activity</u>	<u>Estimated Schedule</u>
System analysis and design	May 2016 to November 2016
Procurement of hardware, software and services	August 2016 to December 2017
Delivery of equipment	July 2017 to January 2021
Site preparation, installation, acceptance tests, training and system commissioning	July 2017 to September 2021

30. The detailed implementation schedules of the above proposals are at Annex.

**ADVICE SOUGHT**

31. Members are invited to comment on the above proposals.

**Security Bureau  
Hong Kong Police Force  
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