For discussion
on 3 June 2025

Legislative Council Panel on Security
Development of the Next Generation Communications System

PURPOSE

This paper seeks Members' views on the development of the Next Generation Communications System (NGCS) by the Hong Kong Police Force (HKPF), and seeks Members' support for submitting the relevant funding proposal to the Finance Committee (FC) of the Legislative Council (LegCo) for approval.

BACKGROUND

Communications infrastructure of the HKPF

2. The Command and Control Communications System (CCCS) of the HKPF has been in operation since 1980s. Apart from supporting the HKPF in handling urgent tasks and daily operation, the CCCS provides inter-departmental internal communications service for participating bureaux and departments of the Unified Digital Communications Platform (UDCP)[1] during joint operations to handle emergencies.

3. The existing Terrestrial Trunked Radio (TETRA) technology has been used as the mobile communications technology for the CCCS since 2004. TETRA is a radio communications standard developed by the European Telecommunications Standards Institute in 1995. Through air interface encryption, TETRA is used in the daily operation of law enforcement agencies

[1] Participating bureaux and departments include the Security Bureau, the Customs and Excise Department, the Fire Services Department, the Government Flying Service, the Auxiliary Medical Service, the Civil Aid Service, the Department of Health, the Electrical and Mechanical Services Department, the Civil Engineering and Development Department, etc.

for the protection of public safety, and during emergency or disaster relief operations to provide mission-critical communications services by transmitting voice and simple text messages. After years of technological advancement, the narrow bandwidth provided by TETRA can no longer keep up with the policing requirements nowadays.

4. The existing maintenance contract for the CCCS will expire in 2027. To meet the current policing needs and support the policy direction of developing Hong Kong into a smart city, as well as to break free from the limitations of narrow bandwidth in TETRA, we propose developing the NGCS. The latest 5th generation mobile broadband (5G) used in the NGCS will replace TETRA as the technology for the CCCS infrastructure of the HKPF in providing mission-critical communications services between frontline officers and the command centre.

Panel on Security meeting in April 2023

5. In April 2023, we presented a paper entitled Information Technology Projects to Enhance Policing Capability[2] to the Panel on Security, briefing Members on the latest development of digital policing and the major information technology projects being planned by the HKPF, including the funding proposal for the NGCS infrastructure. During the meeting, we briefed Members on the preliminary estimate of the project, which involved a non-recurrent expenditure of $5.2 billion in total over six years from 2025-26 to 2030-31. Members supported the HKPF's development of the system to improve the efficiency of law enforcement. Also, Members welcomed the use of parallel tendering to ensure that the tender prices would be considered in the funding application, so as to minimise the risk of cost overrun, and to enable early commencement of the project after obtaining the funding approval.

LATEST PROGRESS

6. Upon obtaining the support of the Panel on Security, the HKPF has conducted a parallel tendering exercise for the NGCS. However, as the project is related to the day-to-day law enforcement work of the HKPF and has a direct bearing on national security, public safety, public order and the maintenance of law and order, the HKPF has conducted an updated risk assessment. Based on

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[2] LC Paper No. CB(2)266/2023(03).

the latest geopolitical risk assessment and taking into account the potential medium to long term risks on the supply chain and information security, the HKPF considers it necessary to tighten the security and reliability requirements of the project, so as to ensure the stability of the supply chain, and to strengthen the assurance of the long term security and availability of the system. Under such circumstances, the HKPF has decided to cancel the tender in the public interest and will adopt the direct engagement approach to identify a reliable service provider that meets the service requirements.

7. Regarding the estimated non-recurrent expenditure, the HKPF has adopted a pragmatic approach and innovative solutions to tackle the challenges facing our public finances. The project requirements have been reviewed and adjusted under the principle of minimising overall project cost. Over the past two years, the HKPF has been paying attention to the development trend of technology, and has actively adopted mainstream and mature technology solutions in the market. After conducting market research on multiple aspects to obtain price information, the HKPF made comparison and selected items with equivalent quality but lower prices, so as to reduce the procurement cost. As for the system design, under the pre-requisite of ensuring system safety and core functionalities, the HKPF simplified the project design (for instance, two sets of hardware originally developed to cater for different user groups have been modified to become one single hardware, with "firewalls" installed for separation) in order to reduce development and maintenance costs. Through the above strategy, we strive to achieve maximum cost effectiveness while meeting project demands. According to market research, the estimated non-recurrent expenditure for the project has been adjusted downwards significantly from about $5.2 billion at the time of briefing at the Panel on Security meeting in April 2023 to about $2 billion, representing a decrease of more than 60%. We plan to seek funding approval from the FC in June this year. If funding approval is obtained, we will proceed with the procurement arrangements in accordance with the Government's policy and procedures. It is expected that the system will come into operation by stages starting from mid-2027.

JUSTIFICATION

(a) Technology trend of mission-critical communications services

8. The current maintenance contract for the CCCS, which is using TETRA technology, will expire in 2027. Meanwhile, the number of suppliers for

TETRA products and services are also on the decrease. With the increasing geopolitical tensions, some technology products and technologies have been prohibited from exporting to Hong Kong. Continuing to use TETRA technology for mission-critical communications services will give rise to considerable uncertainties in product supply, repairing and maintenance.

9. It has become a global trend of law enforcement agencies to use mobile broadband to replace TETRA technology in mission-critical communications services[3]. The Office of the Communications Authority (OFCA) has reserved spectrum in 700MHz band[4], which is suitable for public safety purpose, as the foundation to develop the next generation's public safety communications system and related applications using mobile broadband. The development of 5G technology and related equipment has become more mature and can satisfy the specific requirements for mission-critical communications services. It is now the most opportune time to replace TETRA technology.

(b) Limitations and shortcomings of the TETRA technology

(i) Law enforcement

10. At present, there is an increasing demand for multimedia information, such as videos and audio files, in daily police work. For example, drones and footage of closed-circuit television are used to investigate cases and enhance the capability of evidence collection. In recent years, the HKPF has been actively building fiber optic and wireless local area networks to connect its command and control centres and offices to speed up multimedia data transmission and assist in operational command and manpower deployment. Nevertheless, these new facilities can only be used at designated locations or in specific scenarios. In streets, private premises and commercial premises, the HKPF can only use TETRA system with narrow bandwidth for voice transmission, thus creating a communication gap.

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[3] Law enforcement agencies of countries and areas in the Asia-Pacific region (such as Mainland China, South Korea and Thailand), Europe (such as Belgium, Germany and the United Kingdom), America (such as Canada and the USA) and the Middle East (such as Dubai and Qatar) have already introduced mobile broadband as their main communications technology.

[4] The OFCA has allocated 2 x 10 MHz of the spectrum for emergency communications purpose. The HKPF will continue to discuss with the OFCA regarding the band allocation to prepare for future development.

11. At present, constrained by TETRA's narrow bandwidth, frontline officers can only verbally report the circumstances at scene to console operators and commanders at the command centre. They are unable to send real-time information in the form of audio, video or image. Hence, information on the situation at scene and the discharge of duty may become fragmented, and there may even be omissions and incomplete communication at times. The NGCS will allow commanders to have a better grasp of the circumstances at scene and make timely responses.

12. Due to the constraints of TETRA technology, the existing communications systems may be disrupted at indoor locations or places with poor radio communications signal coverage, or in the event of natural disasters or major and unexpected incidents when deployment of a large number of frontline officers is required. In such case, frontline officers may need to switch to mobile phones using the public mobile network for communication. However, when there is a sudden increase in the number of users, the public network may become congested or the connection may become unstable. When both the radio communications network and public mobile network fail to provide effective communications services, communication between frontline officers and commanders may be interrupted at any time. The NGCS will provide a comprehensive network coverage for transmission of information in real time which allows for provision of timely support to frontline officers.

(ii) <u>Co-ordination of cross-departmental emergency response</u>

13. The voice-centric TETRA technology poses limitations on the co-ordination of participating departments under emergency situations. In case of unexpected incidents, such as disasters caused by natural catastrophes or extreme weather, rescue officers will use the UDCP to share among themselves the information obtained from different channels, such as on terrain, road conditions, weather changes, etc. obtained from different channels. In a rescue operation, which is a race against time, the facts exchanged verbally through radio communications devices or phones may not instantly and clearly present all essential information from different angles. In particular, when dealing with situations such as unexpected incidents and bad weather, which require every precious second to save lives and properties, the current TETRA technology is evidently inadequate.

14. Furthermore, under TETRA technology, communications groups and related devices could only be set up in advance. As such, it is not feasible to create

ad hoc communications groups flexibly among departments in response to the ever-changing circumstances of the operations.

(iii) Communication with the public

15. At present, the use of mobile technology products and online platforms has become more and more common in the community. Members of the public tend to send videos and photos on online platforms as case-related information. In emergencies, such information can considerably enhance the frontline officers' ability to assess on-scene situation and make corresponding decisions to safeguard lives and properties. However, the narrow bandwidth of TETRA has constrained the transmission of these information to frontline officers at scene through the mission-critical communications system, even in emergency situations. With the proposed 5G technology of the NGCS, real-time multimedia information provided by the public can be transmitted to frontline officers through the system to facilitate their performance of duties. Similarly, frontline patrol officers can upload important real-time information to the command centre using 5G technology, so that commanders can devise appropriate strategies and make the best deployment based on the prevailing circumstances.

(c) Merits of 5G technology

16. The technology of 5G does more than solving the existing problem of system obsolescence caused by old technologies. Its high speed, low latency and massive connectivity will lay a foundation where future development and implementation of more innovative and effective policing services will find new opportunities. It will improve operational efficiency of police work and emergency services, and provide support for inter-departmental law enforcement and emergency services.

RECOMMENDATION

(a) Model of infrastructure

17. Taking into account factors including national security, security and reliability requirements of the communications services and cost-effectiveness, the Government proposes to adopt a hybrid model where the infrastructure of the NGCS will be primarily developed by the Government, complemented by commercial services. The Government will build and operate the core network

and base stations of the system to meet the stringent requirements of mission-critical communications, while engaging commercial network services to take advantage of their large number of base stations and wide coverage. The proposed hybrid model will ensure the security of mission-critical communications services while providing wide network coverage to support rescue operations and criminal investigations, and will also enhance reliability and sustainability to ensure that frontline officers can perform duties effectively even in emergencies.

(b) Infrastructural systems and components to be replaced and procured for the development of 5G communications system

18. The main components of the NGCS infrastructure are the core network, radio access network (i.e. base stations), transmission networks, communications console and communications radio equipment.

EXPECTED BENEFITS

19. The NGCS can optimise the efficiency of frontline duties performed by the HKPF and participating departments of the UDCP, and is in line with the policy direction of developing Hong Kong into a smart city. The expected benefits from the system include:

(a) establishing a secure, reliable, highly stable and sustainable communications network to address national security needs;

(b) minimising potential instability in the supply chain or suppliers of technology products in the face of geopolitical tensions;

(c) efficient access and sharing of multimedia information in emergency situations to facilitate law enforcement and protect public safety; and

(d) keeping pace with the global trend of law enforcement agencies in other countries and jurisdictions, i.e. using mobile broadband technology in law enforcement work, so as to achieve the professional standards required.

FINANCIAL IMPLICATIONS

Non-recurrent expenditure

20. We estimate that the above proposal will incur a non-recurrent expenditure of $1,999,812,000 from 2025-26 to 2030-31. The detail breakdown is at **Annex 1**.

Recurrent expenditure

21. The recurrent expenditure to be incurred by the proposed system is $1,745,000 in 2027-28, and will be increased to $96,400,000 annually upon full implementation in 2031-32. The expenditure will cover hardware and software maintenance, system support, communications network, maintenance of communications consoles and radios, rental of shared services of the radio access network, payment for contract staff services, etc. The detail breakdown is at **Annex 2**.

Savings and cost avoidance

22. Upon full implementation of the project, it is estimated that there will be realisable savings of about $59,000,000 annually from 2030-31 onwards as repair and maintenance of the existing system is no longer required.

IMPLEMENTATION PLAN

23. Subject to the views of the Members on the proposal, we plan to seek funding approval from the FC in June 2025. After obtaining funding approval from the FC, it is expected that the contract will be awarded within 2025 and the first phase of the service can be launched starting from mid-2027. The tentative implementation plan is as follows:

	Main Task	Target Date of Completion
(a)	Seeking funding approval from the FC	June 2025
(b)	Award of contract	December 2025
(c)	System design	June 2026

	Main Task	Target Date of Completion
(d)	Delivery and installation of equipment	December 2026
(e)	Testing and commissioning	June 2027
(f)	Launching of the first phase of the system (together with the first batch of base stations)	June 2027
(g)	Delivery, installation and service commencement of the second batch of base stations	June 2028
(h)	Delivery, installation and service commencement of the third batch of base stations (full operation of the system)	December 2030

ADVICE SOUGHT

24. Members are invited to provide views on the above proposal. Subject to the support from the Panel of Security, we will submit the funding proposal to the FC.

Security Bureau
Hong Kong Police Force
May 2025

Annex 1

Next Generation Communications System Infrastructure of the Hong Kong Police Force
Non-recurrent Expenditure

Item	2025-26 ($'000)	2026-27 ($'000)	2027-28 ($'000)	2028-29 ($'000)	2029-30 ($'000)	2030-31 ($'000)	Total ($'000)
(a) Hardware and software							
(i) Core network	384	3,462	150,005	61,985	79,777	10,976	306,589
(ii) Radio access network and transmission networks	339	3,058	132,511	129,718	137,313	53,304	456,243
(iii) Communications console and communications equipment	489	4,399	190,634	108,003	8,628	959	313,112
(b) Implementation and installation services and contract staff	16,559	20,698	217,816	230,805	283,478	59,282	828,638
(c) Contingency	889	1,581	34,548	26,526	25,460	6,226	95,230
Total	**18,660**	**33,198**	**725,514**	**557,037**	**534,656**	**130,747**	**1,999,812**

Notes:

Item(a)(i) : The estimate of **$306,589,000** is for the procurement of hardware, software and user licenses required for the core network, including core network servers, network management systems, mission-critical communications platforms, telephone and network gateways, etc.

Item(a)(ii) : The estimate of **$456,243,000** is for the procurement of radio access network (base stations), the setting up of shared radio access network, backbone equipment (for connection with the data centre) and digital transmission networks (for connection with base stations, shared base stations and mobile base stations), etc.

Item(a)(iii) : The estimate of **$313,112,000** is for the procurement of consoles and communications facilities, including communications console, communications equipment and their accessories.

Item(b) : The estimate of **$828,638,000** is for engineering and professional services (site survey, design, installation, testing, acceptance). The services involve site preparation, system installation, system implementation, interfacing and integration, relocation, training, engagement of contract staff, etc., and include the setting up of shared services of radio access network (i.e. sharing of base station infrastructure of the public mobile network, use of shared base stations of the public mobile network and shared spectrum, etc.)

Item(c) : The estimate of **$95,230,000**, amounting to 5% of the expenditure for items (a)-(b) above, is for contingency.

Annex 2

Next Generation Communications System Infrastructure of the Hong Kong Police Force
Recurrent Expenditure

Recurrent Expenditure	2025-26 ($'000)	2026-27 ($'000)	2027-28 ($'000)	2028-29 ($'000)	2029-30 ($'000)	2030-31 ($'000)	From 2031-32 onward ($'000)
(a) Hardware and software maintenance and support services for core network, mission-critical communications platforms and wireless access network, etc.	0	0	357	49,160	61,889	61,913	66,983
(b) Maintenance of communications console and communications equipment	0	0	0	1,222	2,437	2,437	2,437
(c) Wireless access network shared services, transmission network line rental and other services provided by the network	0	0	1,388	14,878	26,980	26,980	26,980
Total	**0**	**0**	**1,745**	**65,260**	**91,306**	**91,330**	**96,400**

Notes:

Item(a) : Expenditure arising from maintenance, consumables, licensing, updating and support services for the newly acquired core system network, mission-critical communications platforms, wireless access network and other centralized equipment.

Item(b) : Maintenance arising from the newly acquired communications consoles and communications equipment.

Item(c) : Expenditure on shared wireless access network services, carrier lines and other services for the use of the public mobile network.