

**For discussion on
9 April 2018**

**Legislative Council
Panel on Information Technology and Broadcasting**

120KA — Building a Government Data Centre Complex

PURPOSE

This paper briefs Members on the proposal for upgrading the remainder of the project **120KA - “Building a Government Data Centre Complex”** to Category A at an estimated cost of \$2,251.7 million in money-of-the day (“MOD”) prices.

BACKGROUND

2. Currently, government data centres are hosted in different locations and usually co-located with the relevant government bureaux and departments (“B/Ds”) in general office buildings. About 80% of the government data centres have reached or almost reached their capacity limits in terms of space, power and cooling efficiency. Given the inherent constraints in general office buildings, we cannot rely solely on improvements to the capacity and efficiency of the existing facilities to meet the increasing demand for data centre services.

3. To address these problems and to support the long-term development of B/Ds’ data centre services, we plan to build a purpose-built government data centre complex (“the Complex”) to coordinate and address the increasing demands for hosting government information technology (“IT”) services and to create synergies in government data centre operations, hence enabling B/Ds to be more agile and adaptable to changes in business requirements and latest technology advancement.

4. On 8 December 2014, we consulted members of this Panel on the project proposal for the Complex. On 26 June 2015, the Finance Committee (“FC”) of the Legislative Council (“LegCo”) approved a funding commitment of \$52.6 million to conduct pre-construction consultancy services for the Complex.

5. The design and site investigation works for the Complex were completed in 2017. The key design features of the Complex include the

provision of highly resilient critical infrastructure facilities, security monitoring and access control systems, as well as energy-saving design. In December 2017, the Government invited tenders for the construction of the Complex (including the key features and functions described in paragraph 6 below). The works contract will be awarded after obtaining the funding approval of the FC.

PROJECT SCOPE AND NATURE

6. The Complex will be built on a site in King Lam Street, Cheung Sha Wan, occupying an area of about 1 400 square metres (m²) with a construction floor area of about 13 800 m². The 13-storey building will include the following facilities:

- (a) data centre specific areas, including:
 - (i) data centre halls with around 1 400 racks for accommodating servers and IT facilities of B/Ds; and
 - (ii) ancillary rooms such as media storage room, equipment rooms, command centres, etc.;
- (b) resilient critical infrastructure facilities to support high availability data centre services, including:
 - (i) resilient power supply system with dual power paths from two power substations;
 - (ii) resilient and energy efficient cooling system providing hot/cold aisle solutions¹ for data centres operations;
 - (iii) resilient structured cabling infrastructure providing reliable and flexible cable connections and facilitating alternation/re-routing of cabling system; and
 - (iv) dual network lead-in distribution paths facilitating resilient external network connections;
- (c) security monitoring and access control systems to provide stringent security and protection for the entire Complex;
- (d) energy efficient features and renewable energy installations such as LED lightings and photovoltaic system; and
- (e) office accommodation for supporting daily operations of the Complex.

¹ Hot/cold aisle solution is a design for air-conditioning circulation in data centre halls. Rows of racks are placed front-to-front and back-to-back to form aisles with hot and cold air separation, in order to increase the cooling efficiency of the air-conditioning system.

The infrastructure facilities described in paragraph 6(b) have additional components and distribution paths to prevent disturbance to the system operations in the event of single component failure.

7. The site and location plan of the proposed Complex is at the **Enclosure**.
8. Subject to the funding approval of the FC, we plan to commence the construction works in the third quarter of 2018 for completion in the third quarter of 2021.

DETAILED JUSTIFICATIONS

Outdated Government Data Centre Design and Ageing Facilities

9. The Government is expediting the use of IT services to cope with the ever-increasing public demand for reliable and convenient e-Government services. The Government therefore adopts cloud computing² to meet the rising computing demand in a fast, flexible, scalable and cost-effective manner. Such IT equipment (especially cloud computing facilities) demands larger electrical power and cooling capacity.

10. More than 50% of the existing government data centres have already been set up and in operation for over 20 years. Their outdated design cannot cope with the stringent demands on electrical power and cooling capacity requirement of new IT equipment. Moreover, the various constraints in the original design and building structure (e.g. insufficient headroom and lack of space) of the existing data centres allow limited in-situ improvement works to be made. The ageing facilities also significantly increase the risks of service interruptions.

11. By adopting latest technologies, the Complex will be built with resilient and energy efficient power supply and cooling system to meet the increasing demands for power and cooling capacity. It can also enhance the agility, reliability, security, capacity and availability of government data centre services and improve the performance and energy efficiency.

² Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

12. With the highly resilient design of the critical infrastructure facilities, the Complex can better mitigate the potential risks of data centre service outage and provide reliable e-Government services to the public.

Synergies in Government Data Centre Facilities and Services

13. The Complex can address the long-term needs of B/Ds in hosting IT services. The Complex will:

- (a) re-provision existing government data centres which require relocation, including those affected by the relocation of the three government buildings in the Wan Chai Government Offices Compound;
- (b) accommodate data centre services for B/Ds which need to switch their IT operations from outsourced data centres to government data centres so as to avoid risks of service interruption and significant increase in service cost arising from contract renewal or change in service providers;
- (c) enhance data centre capacity; and
- (d) address data centre service demands from new initiatives, such as the smart city projects, the next generation government cloud services, big data analytics platform, etc.

14. At this stage, we envisage that the Complex would accommodate five existing government data centres³ as well as the new data centre services of four B/Ds⁴. Through consolidating data centre facilities and operations, the Complex can enhance synergy and flexibility in terms of resources sharing so that the Government will achieve savings in both capital investment and recurrent operation for data centre services.

Ensuring Stringent Security Control and Monitoring

15. The Complex, which will be a purpose-built facility operating in government-owned premises and dedicated to the government data centre use, will facilitate security control and monitoring. The Complex has security design

³ Including the data centres of Census and Statistics Department, Leisure and Cultural Services Department, Hong Kong Police Force, Office of the Government Chief Information Officer and The Treasury.

⁴ Including Education Bureau, Food and Health Bureau (Electronic Health Record Sharing System), Hong Kong Observatory and Immigration Department.

features to ensure stringent security control on the data centre building and facilities against physical security threats. CCTV system and access control system will be deployed to enforce security monitoring across the building perimeter, data centre halls, plant rooms and other facilities to provide a secure environment for the provision of data centre services to B/Ds.

More Environmentally Friendly Operation of Government Data Centre Services

16. Electricity demand of data centres operation is higher than conventional office buildings. Green data centre design, construction, management and operation practices are widely adopted worldwide. Existing government data centres are lagging behind their commercial counterparts in terms of energy efficiency since they are not purpose-built, with outdated design and ageing facilities. The Complex will adopt green technologies and energy-saving design that will reduce energy consumption and carbon footprint. Energy efficient cooling and lighting systems will be adopted to save energy. Environmentally friendly fire suppression system will also be adopted. Moreover, photovoltaic system will be installed to provide renewable energy for the Complex. We aim to obtain the second highest grade under the Building Environmental Assessment Method (BEAM) Plus, a green building labelling system promulgated by the Hong Kong Green Building Council.

FINANCIAL IMPLICATIONS

17. The estimated cost of the project is about \$2,251.7 million in MOD prices, which includes the costs for site works, foundation works, building works, drainage works, furniture and equipment, etc.

PUBLIC CONSULTATION

18. We consulted the Sham Shui Po District Council on the project on 16 January 2018. Members of the District Council supported the project and advised that the Government should pay attention to the potential risks arising from the dangerous goods stores adjacent to the Complex site. In fact, during the design stage, we have already included the necessary mitigation measures in the design of the Complex to address the potential risks arising from the adjacent stores.

WAY FORWARD

19. Subject to Members' support, we plan to consult the Public Works Subcommittee for submission of the funding proposal to FC for upgrading the remainder of the 120KA to Category A.

**Innovation and Technology Bureau
Office of the Government Chief Information Officer
March 2018**

