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Panel on Information Technology and Broadcasting

Meeting on 16 April 2019

Updated background brief on smart city development

Purpose

This paper provides updated background information on smart city development. It also summarizes the views and concerns expressed by Members in previous discussions on the subject.

Background

2. In the 2017 Policy Address, the Chief Executive ("CE") reaffirms the Administration's commitment "to developing Hong Kong into a smart city by using innovation and technology to enhance city management and improve people's livelihood". The Administration's objectives of smart city development are to:

- (a) address urban challenges to enhance city management and improve quality of living, sustainability, efficiency and safety of Hong Kong through making use of innovation and technology;
- (b) enhance city attractiveness to global business and talents; and
- (c) inspire continuous city innovation and sustainable economic development.

Smart City Blueprint for Hong Kong

3. The Administration released the Smart City Blueprint for Hong Kong ("the Blueprint")¹ on 15 December 2017, which outlines the vision and mission of building Hong Kong into a world-class smart city. Based on the recommendations of a consultancy report completed in June 2017,² the Blueprint sets out a clear and concrete direction for smart city development in Hong Kong and maps out development plans in the next five years.

4. The vision of the Blueprint is to "embrace innovation and technology to build a world-famed Smart Hong Kong characterized by a strong economy and high quality of living". Smart city development plans cover six major areas, namely "Smart Mobility", "Smart Living", "Smart Environment", "Smart People", "Smart Government" and "Smart Economy". The key initiatives in each of the six major areas are listed at **Appendix I**.

5. The Administration has set up a dedicated Smart City Office in the Innovation and Technology Bureau ("I&TB") to coordinate smart city projects of government departments, and public and private organizations, as well as to monitor project progress and effectiveness.

Key infrastructure projects for smart city development

6. CE announced in the 2017 Policy Address that the Administration would take forward the following three key smart city infrastructure projects:

¹ Smart City Blueprint for Hong Kong ("the Blueprint") can be downloaded at the dedicated smart city portal (www.smartcity.gov.hk).

² In September 2016, the Office of the Government Chief Information Officer commissioned PricewaterhouseCoopers Advisory Services Limited to conduct a nine-month "Consultancy Study on Smart City Blueprint for Hong Kong" to assist in the formulation of the overall development framework of the Blueprint. The study made short-, medium- and long-term recommendations in six major areas, namely: "smart mobility", "smart living", "smart environment", "smart people", "smart government" and "smart economy". These recommendations are set out in the Administration's letter dated 9 August 2017 and circulated to members of the Panel on Information Technology and Broadcasting on 10 August 2017 vide [LC Paper No. CB\(4\)1511/16-17\(01\)](#).

- (a) provision of an electronic identity ("eID") for all Hong Kong residents: this project allows each Hong Kong resident to use a single digital identity and authentication to conduct government and commercial transactions online;
- (b) installation of multi-functional smart lampposts³ at selected urban locations: this pilot project supports the building of a smart city with city-wide coverage of data and network; and
- (c) implementation of the next generation government cloud ("GovCloud") infrastructure: the GovCloud will be equipped with a new application architecture and a big data analytics platform to support the adoption of new cloud and system development technologies by government bureaux and departments.

7. On 11 May 2018, Finance Committee ("FC") of the Legislative Council approved the creation of a commitment of \$112.0 million for implementing a one-stop online system for the provision of eID, and a commitment of \$533.3 million for implementing the GovCloud infrastructure and big data analytics platform to support agile delivery of e-Government services. Both projects are funded under Capital Works Reserve Fund Head 710 - Computerisation. According to the Administration, both systems were expected to be launched by 2020. As regards the implementation of the pilot scheme of smart lampposts, the relevant expenditure would be paid under the block vote under Head 706 - Highways.

Wi-Fi Connected City Programme

8. In May 2016, FC approved a funding commitment of \$500 million for implementing the Wi-Fi Connected City Programme, which sought to expand the coverage of "Wi-Fi.HK" hotspots progressively. The programme also enlists the participation of more public and private organizations to provide the public and visitors with free Wi-Fi services in various districts across the territory. As at end-April 2018, the "Wi-Fi Connected City" programme has provided about 21 800 free Wi-Fi hotspots

³ Under the pilot scheme, the Administration will install some 400 smart lampposts at four selected urban locations (including Central/Admiralty, Causeway Bay/Wan Chai, Tsim Sha Tsui and Kwun Tong/Kai Tak Development Area). The first phase with some 50 smart lampposts is expected to come into operation by mid-2019, and the remaining some 350 smart lampposts will be rolled out by phases. The pilot scheme is expected to be completed by 2021-2022.

which cover different types of venues, including universities and tertiary institutions, parks, cultural and sports venues, entertainment and leisure venues, government offices, youth service centres and study rooms, hospitals, banks, malls, food premises, hotels, convenience stores, telephone booths, public transport facilities, etc.

Previous discussions

9. The Administration briefed the Panel on Information Technology and Broadcasting ("the Panel") on the major components of the Blueprint at the meeting on 8 January 2018 and, at the meeting held on 12 March 2018, sought the Panel's support for the funding proposals for three key infrastructure projects for smart city development as proposed in the 2017 Policy Address (paragraph 6). Panel members supported the funding proposals. At the Panel meeting held on 14 May 2018, the Administration briefed members on the latest progress of the implementation of the Wi-Fi Connected City Programme. Relevant issues were also discussed at the FC meetings on 19 April 2018 and 11 May 2018. The major views and concerns expressed by Members are summarized in the ensuing paragraphs.

Smart City Blueprint and infrastructure

10. Members expressed concerns that some of the Administration's initiatives on smart city development might take a long time to implement. By the time the projects were completed and in operation, the respective technologies adopted might already be outdated. Members also expressed concerns that Hong Kong might lag behind its regional neighbours in smart city development. On this issue, the Administration maintained that CE's Steering Committee on Innovation and Technology comprising key directors of Bureaux was determined to implement the Blueprint. Furthermore, Hong Kong's progress in the smart city development vis-à-vis other major cities would be reflected in the performance indicators published by the International Organization for Standardization (ISO37122).

Smart mobility

11. Members suggested that the Administration should encourage private car park operators and other organizations to share real-time parking vacancy information with the public, and to integrate such data into the Hong Kong eRouting application. Some other members suggested that the Administration should integrate the Hong Kong eTransport application

with other public transport information systems such as tram, MTR or bus in order to better achieve the objectives of "Smart Mobility" under the Blueprint. The Administration responded that it was already cooperating with the private sector and public transport operators on sharing operational data. As transport operation data were commercial assets, the Administration could only encourage companies to share their data with the Government.

Smart government

12. As the Administration would be able to collect a large amount of personal data of the public and would share such data with other parties for big data analytics purposes, some members expressed concerns that personal data and privacy might be exposed, especially through the use of the eID system. The Administration assured the Panel that the Government had the responsibility to protect personal data in accordance with the Personal Data (Privacy) Ordinance (Cap. 486). Besides, a person would not disclose his/her personal data when using eID to authenticate his or her identity when accessing government services online because eID system verified the user's identity by his/her unique biometric information such as fingerprints, facial, retinal scans or voice features. No personal data would need to be transmitted over the Internet.

13. Members had asked if the Administration would engage third party companies in the design and development of application programming interfaces ("APIs") in order to speed up the launch of services that make use of eID. Some members asked if eID would be used in financial applications such as know-your-customers ("KYC") utilities to enable more effective compliance with regulatory requirements by financial institutions. The Administration informed members that details regarding the development of APIs and KYC utility applications were being examined in collaboration with the relevant stakeholders/regulators.

14. Members enquired whether the public could, upon implementation of eID, still provide personal data to service providers through existing procedures when making transactions, including submitting the hard copies of documents and going through relevant procedures in person. Some members expressed concern that with a substantial proportion of elderly persons not having smartphones, it would be difficult to fully popularize the application of eID. They queried how the Administration would increase the proportion of elderly persons using eID.

15. The Administration advised that it was indeed a challenge to change the mode of transactions often used by elderly persons, and more time was required for the elderly population to get used to using eID. Even if eID was implemented, members of the public were still free to choose whether they would like to use eID in various transactions. The Administration would try to create a favourable environment, such as through the provision of APIs, to facilitate e-service providers incorporate eID in their services.

Smart economy

16. In discussing the dissemination of tourism information through smart lampposts and other smart city facilities, members commented that the Administration should formulate an overarching strategic plan to use smart city technologies to enrich tourists' experience in Hong Kong rather than provide piecemeal measures on isolated tourist spots.

Smart living

17. Noting that the Administration had plans to introduce a Faster Payment System⁴ by 2018, members expressed concerns about the risks involved, particularly in the use of QR code. The Administration advised that the Hong Kong Monetary Authority was working with the financial sector to develop a common QR code payment standard, under which stored value facility operators were required to monitor and evaluate the risks and security of these payment systems.

Multi-functional smart lampposts

18. Members commented that the Administration should ensure that the public would be able to receive a wide variety of information from the smart lampposts. Some members considered that the Administration's target period of installing smart lampposts was too long. Some other members suggested that smart lampposts should be used to support fifth-generation ("5G") communications technology and to improve the accuracy of Global Positioning System ("GPS"). The Administration responded that real-time information such as local air quality data and traffic flow conditions would be collected from the smart lampposts and disseminated through the open data portal and microcell antennas could be installed in smart lampposts to support 5G telecommunications services and improve GPS.

⁴ Faster Payment System ("FPS") is a platform which connects banks and stored value facility operators. Users may transfer money and carry out transactions by phone or by email using a QR code through FPS.

19. Some members enquired whether the private sector could collect and disseminate information using the smart lampposts. The Administration advised that business organizations would be welcome to collaborate with the Administration to use smart lampposts to deliver services if security and privacy issues could be addressed.

Wi-Fi Connected City Programme

20. Some members commented that the Office of Communications Authority's removal of under-used telephone booths with free Wi-Fi hotspots was contrary to the Administration's objective in developing a Wi-Fi connected city. They suggested that I&TB should explore with the Commerce and Economic Development Bureau on the feasibility of converting some of the under-used public telephone booths into smart city facilities with free Wi-Fi connections (such as smart lampposts).

21. The Administration indicated that sites with high pedestrian flow or tourist hotspots would be identified for installing smart lampposts with free Wi-Fi hotspots, either on its own or through public-private participation arrangements. Furthermore, consideration was being made to providing Wi-Fi connection services with mobile network technology in areas of low pedestrian traffic, such as public parks, whereas high speed connection services would be provided in tourist hotspots or areas of high pedestrian concentration.

22. Some members suggested that the Administration should provide clear signage to inform users of the availability of free Wi-Fi hotspots nearby and should step up publicity on free public Wi-Fi services. There was suggestion from members that the Administration should upgrade the existing equipment and technology of the free public Wi-Fi services. The Administration responded that, for equipment and facilities installed in government premises, the Administration would upgrade the equipment to support the latest 802.11ac standard and would replace copper wire with optical fibre to increase connection speed of the network and to reduce the frequency of disconnection and other interruption to Internet connection.

Questions raised at Council meetings

23. Members, including Hon Martin LIAO, Hon Paul TSE, Dr Hon LO Wai-kiwok, Hon CHAN Chun-ying, Hon AU Nok-hin, Hon Jeremy TAM, Hon Charles Peter MOK, Dr Hon Pierre CHAN and Mr WU Chi-wai, have

raised questions related to the Blueprint and the smart city development at Council meetings. Details of the questions and the Administration's replies are given in the hyperlinks in **Appendix II**.

Latest position

24. The Administration will brief the Panel on 16 April 2019 on the implementation progress of the Blueprint.

Relevant papers

25. A list of the relevant papers is set out in **Appendix II**.

Council Business Division 1
Legislative Council Secretariat
10 April 2019

Key initiatives of smart city development plans in the Smart City Blueprint for Hong Kong

Smart mobility

- (a) Integrate existing e-transport applications into an all-in-one mobile application by 2018 to facilitate journey planning;
- (b) Release real-time information of franchised buses through mobile devices by 2018 and information display panels at government public transport interchanges and covered bus stops by 2020;
- (c) Complete the installation of traffic detectors on all strategic roads to provide real-time traffic information by 2020;
- (d) Install new on-street parking meters to support multiple payment systems starting from 2019-2020 with provision of real-time parking vacancy information;
- (e) In light of the results of the feasibility study, engage the public to develop a detailed Electronic Road Pricing Pilot Scheme in Central and its adjacent areas and its implementation strategy in 2019;
- (f) Facilitate trials of autonomous vehicles in the West Kowloon Cultural District and other areas as appropriate;
- (g) Pilot the use of technology to deter improper use of roadside loading and unloading bays and illegal parking in Kowloon East from 2018;
- (h) Establish "bicycle-friendly" new towns and new development areas;
- (i) Continue to take forward "Walk in HK" by providing a pedestrian-friendly environment; and

- (j) Explore the provision of a convenient and smooth travel experience by using facial biometrics technology including at check-in, boarding pass checkpoint and boarding.

Smart living

- (a) Introduce a Faster Payment System by 2018 which supports users to transfer money anytime and anywhere by phone number or email address;
- (b) Facilitate the development of a QR code payment standard to promote the wider use of mobile retail payments and bring greater convenience to customers and merchants;
- (c) Launch the \$1 billion "Innovation and Technology Fund for Application in Elderly and Rehabilitation Care" in 2018 to subsidise elderly and rehabilitation service units to try and procure technology products;
- (d) Set up a Big Data Analytics Platform by the Hospital Authority for facilitating healthcare-related research in 2019, and start adopting a smart hospital approach for piloting by 2020; and
- (e) Provide all residents, by 2020, a free electronic identity ("eID") which is a single digital identity for authentication when conducting government and commercial transactions online.

Smart environment

- (a) Phase down coal-fired electricity generation gradually and replace with natural gas and non-fossil fuel sources;
- (b) Apply renewable energy on a wider and larger scale based on mature and commercially available technologies with the public sector taking the lead;
- (c) Install light-emitting diode ("LED") lamps in public lighting systems progressively starting from 2017/2018 and encourage retrofitting LED lighting for existing government buildings;
- (d) Promote retro-commissioning and building-based smart/innovation and technology ("I&T") technologies;

- (e) Use remote sensing devices to monitor air quality, cleanliness of streets and public places, and usage of litter and recycling bins; and
- (f) Continue to include requirements in the sale of new lots in Kowloon East, including green building design, provision of smart water meter system, charging facilities for electric vehicles and real-time information on vacant parking spaces.

Smart people

- (a) Organise intensive training programmes on science, technology, engineering and mathematics ("STEM") education for curriculum leaders of primary and secondary schools from the 2017/2018 to 2019/2020 school years;
- (b) Encourage industries to hire STEM graduates for research and development ("R&D") through the Postdoctoral Hub Programme and the enhanced Internship Programme;
- (c) Attract and retain more I&T professionals, especially in biotechnology, data science, artificial intelligence, robotics, financial technology and cyber security. Launch a fast-track pilot I&T talent admission scheme in 2018; and
- (d) Provide support to young entrepreneurs and start-ups to build a stronger I&T culture.

Smart government

- (a) Fifth generation ("5G") mobile networks can offer ultra-high speed and high capacity services, support device-to-device ultra-reliable/low-latency communications, and enable massive machine-to-machine communications for better implementation of the Internet of Things. Hong Kong is all geared up for the commercial launch of 5G services and applications in 2020;
- (b) Open up more public and private sector data in digital forms to facilitate research and innovation;

- (c) Adopt eID common login by 2020 and enhance the e-services user experience with the help of artificial intelligence, chatbot and big data analytics;
- (d) Implement the multi-functional smart lampposts pilot scheme starting from 2019 to facilitate collection of real-time city data to enhance city management and other public services;
- (e) Build a new big data analytics platform by 2020 which will enable real-time data transmission and sharing among government departments;
- (f) Revamp the government cloud infrastructure platform by 2020 to enable digital government services delivery; and
- (g) Adopt Building Information Modelling for major government capital works projects starting from 2018 and develop Common Spatial Data Infrastructure by 2023.

Smart economy

- (a) Facilitate the introduction of virtual banking as another model of service delivery;
- (b) Provide tourist facilitation services through smart technologies by 2018 at the Hong Kong International Airport, the West Kowloon Station of the Guangzhou-Shenzhen-Hong Kong Express Rail Link and the Hong Kong Boundary Crossing Facilities of the Hong Kong-Zhuhai-Macao Bridge;
- (c) Provide enhanced tax deduction for qualifying expenditure incurred by enterprises on R&D in 2018/2019 to incentivise companies to increase investment in technological R&D;
- (d) Review the Government's procurement arrangements by 2018 to include I&T as well as design thinking as tender requirements to encourage local technological innovation and underscore the user-centric approach; and
- (e) Review existing legislation and regulations so as to amend outdated provisions which impede I&T development.

(Source: [LC Paper No. CB\(4\)429/17-18\(03\)](#))

Appendix II

List of relevant papers

Issued by	Meeting date/ Issue date	Paper
The Administration	18 January 2017	The Chief Executive's 2017 Policy Address Policy Address
Council meeting	22 November 2017	Question No. 1 raised by Hon Martin LIAO Implementation of pilot projects relating to smart cities
	22 November 2017	Question No. 11 raised by Hon Paul TSE Provision of free Wi-Fi services by the Government
	10 January 2018	Question No. 6 raised by Dr Hon LO Wai-kwok Development of smart city
	28 March 2018	Question No. 15 raised by Hon CHAN Chun-ying Developing Hong Kong into a smart city
	25 April 2018	Question No. 1 raised by Hon AU Nok-hin Multi-functional smart lampposts installed in Hong Kong Science Park
	25 April 2018	Question No. 15 raised by Hon Jeremy TAM Smart City Blueprint for Hong Kong
	25 April 2018	Question No. 21 raised by Hon Charles Peter MOK Converting on-street facilities into infrastructural facilities needed for building a smart city

Issued by	Meeting date/ Issue date	Paper
Council meeting	30 May 2018	Question No. 10 raised by Dr Hon Pierre CHAN Provision of free Wi-Fi services in public hospitals
	27 February 2019	Question No. 11 raised by Mr WU Chi-wai Making use of next generation government cloud infrastructure
Panel on Information Technology and Broadcasting	17 October 2017	The Chief Executive's 2017 Policy Address – Policy Initiatives of Innovation and Technology Bureau LC Paper No. CB(4)25/17-18(02) Minutes of meeting LC Paper No. CB(4)419/17-18
	8 January 2018	Administration's paper on the Smart City Blueprint for Hong Kong LC Paper No. CB(4)429/17-18(03) Updated background brief on the smart city development LC Paper No. CB(4)429/17-18(04) Minutes of meeting LC Paper No. CB(4)699/17-18
	12 March 2018	Administration's paper on the key infrastructure projects for smart city development LC Paper No. CB(4)701/17-18(03) Administration's response to issues raised at the meeting on 12 March 2018 LC Paper No. CB(4)1051/17-18(01) Minutes of meeting LC Paper No. CB(4)1197/17-18

Issued by	Meeting date/ Issue date	Paper
Panel on Information Technology and Broadcasting	14 May 2018	Administration's paper on progress update on the implementation of the Wi-Fi Connected City Programme LC Paper No. CB(4)1036/17-18(05) Updated background brief on the smart city development LC Paper No. CB(4)1036/17-18(06) Minutes of meeting LC Paper No. CB(4)1594/17-18
	23 October 2018	The Chief Executive's 2018 Policy Address – Policy Initiatives of Innovation and Technology Bureau LC Paper No. CB(4)24/18-19(01)
Special Finance Committee	19 April 2018	Administration's replies to Members initial written questions (Reply Serial Nos. ITB002, ITB006, ITB011, ITB035, ITB039, ITB043, ITB052, ITB068, ITB069, ITB075, ITB089, ITB090, ITB095, ITB209, ITB215, ITB225, ITB237, ITB254, ITB255) Minutes of meeting
Finance Committee	11 May 2018	CAPITAL WORKS RESERVE FUND HEAD 710 – COMPUTERISATION Office of the Government Chief Information Officer New Subhead "Electronic Identity (eID)" New Subhead "Digital Transformation for Agile Delivery of e-Government Services" FCR(2018-19)9 Minutes of meeting LC Paper No. FC9/18-19