For Discussion
On 18 February 2025

Legislative Council House Committee
Subcommittee on Policy Issues Relating to
Strengthening and Promoting the Development of Kowloon East as the Second Core Business District

Smart City Development in Kowloon East

PURPOSE

This paper briefs Members on the implementation of various smart infrastructures for the Second Core Business District (CBD2) in Kowloon East (KE), and the strategy of taking forward low-altitude economy by the Government.

A. Smart Infrastructures

2. To tie in with the sustainable development of KE and promoting KE as a smart, green and resilient CBD2, relevant government bureaux/departments have been striving to take forward projects with enhanced efficiency and quality by incorporating smart, green and resilient infrastructures into the design at the early planning stage. In addition to advocating the use of low-carbon and environmentally friendly designs in buildings, the Government also promotes the use of smart, advanced construction methods and materials and integrated digital technologies, as well as adopting new construction mode for projects to enhance the effectiveness of construction with innovation and technology. KE is located in a mix of new and old areas, making it an ideal testing ground for smart city. It can effectively allow the citizens to experience the benefits brought by smart city and innovative technologies in daily live. Relevant smart city initiatives can also be extended for application in other districts to enhance urban sustainable development.

Resilient Flood-control Infrastructures

Smart Drainage, Hydrological Information System and Remote-Controlled Desilting Robots

3. In recent years, the Drainage Services Department (DSD) proactively applies innovative technologies in drainage works, including the development and expansion of a smart drainage and hydrological information system and the adoption of remote-controlled desilting robots. The DSD has continued to strengthen its hydrological information system and makes use of the self-developed mobile applications to monitor in real time the hydrometric data from over 300 remote stations, including rainfall in various districts, water levels of major rivers and drainage channels (such as Tsui Ping River and Kai Tak River), as well as tide levels at different locations. The DSD has also carried out trials to monitor water level at manholes and the flood situation of roads. For example, in early 2024, the DSD selected 16 suitable manholes in the locations of Wong Tai Sin District where serious flooding had occurred and installed smart sensors "LeMonSwitch" to monitor the water level of stormwater drains round-the-clock in real time. Also, DSD has also installed smart sensors "Flood Monitoring Device" at Lung Cheung Road in Wong Tai Sin and Tsui Ping Road in Kwun Tong to monitor the flooding condition at carriageway in real time. Upon receipt of alerts, staff would be deployed immediately to inspect and carry out emergency clearance works at the locations concerned to reduce flooding risk. In addition, the DSD has brought in the river and drainage channel desilting robots and pipeline inspection robots to assist in maintenance works so as to improve the efficiency and safety for operation and maintenance of drainage system in KE.

Drainage Improvement Works

4. Owing to the increase in surface runoff caused by continuous land development and torrential rainstorms caused by climate change, the flood risks in the vicinity of Lung Cheung Road near Shatin Pass Road at Wong Tai Sin and MTR Ngau Tau Kok Station at Kwun Tong have been increased. Flooding incidents occurred at the above-mentioned areas, causing impacts to the nearby traffic and the public. The DSD is taking forward expeditiously "Drainage Improvement Works in Wong Tai Sin" and "Drainage Improvement Works in Kwun Tong – phase 2", including the construction of underground stormwater storage tanks and drainage improvement works in Wong Tai Sin Morse Park and Kwun Tong Hoi Bun Road Park. During heavy rainstorm, stormwater will be intercepted to the proposed

underground stormwater storage tanks for temporary storage. The stored stormwater will be subsequently discharged into the downstream Kai Tak River and Kwun Tong Typhoon Shelter. Upon completion of the drainage improvement works, the capacity of the relevant drainage systems will be upgraded and the flood risks in the areas concerned will be alleviated. The proposed stormwater storage tanks will be equipped with smart systems capable of receiving the rainfall forecasts from the Hong Kong Observatory and monitoring the water levels at the downstream drains in real time, in order to automatically control the operation of the stormwater storage tanks. The two projects commenced in 2024 would complete in 2029 in stages.

Revitalization of Tsui Ping River

5. Located in Kwun Tong, Tsui Ping River is formerly known as King Yip Street nullah, spanning from the upstream at Tsui Ping Road, King Yip Lane and King Yip Street all along to Victoria Harbour. It is about one kilometre long and was constructed over 50 years ago. It was a drainage facility constructed in the past with the primary objective of flood conveyance, relatively lacking in ecological value and vibrancy. To address this, the Government actively implemented the Revitalization of Tsui Ping River project, which was completed and opened to the public for use by the end of 2024. A "Smart Water Gate" is installed near the downstream of the river, which will rise and fall in rhythm with the tide levels to capture and store the seawater. This helps stabilize the water level, enhance the water ecology and also relieve the odour issue in the river. The use of the "Smart Water Gate" is an innovative approach to river management. Its operation connects to the weather forecasting system of the Hong Kong Observatory as well as the real-time water level monitoring system of the river. During inclement weather or when the actual river water level reaches the pre-set trigger level, the water gate will automatically lower to enable the full flood conveyance capability of the river. During low tide condition, the water gate will also create a waterfall effect which serves as a scenic spot in the city.

Smart Integrated Construction

6. The Government is also taking the lead to apply new technology in construction. For example, the Trunk Road T2 and Cha Kwo Ling Tunnel project employs Modular Integrated Mechanical, Electrical, and Plumbing (MiMEP) to design the tunnel facilities such as fire mains, cable shaft and drain pipes as a wall and ceiling-mounted modular structure, facilitating the installation in the tunnel

facilities corridor underneath the carriageway with shortening of construction period and enhancement of site safety. Apart from MIMEP, the project has also employed other innovative technologies and advanced construction techniques, including design for manufacture and assembly, mechanized construction, smart tunnel inspection systems, building information modelling (BIM), digital project management system (DWSS) and smart site safety management. These measures comprehensively enhance speed, quantity, efficiency, quality, and site safety of the project. Among these, the smart tunnel inspection systems is the world's first tunnel inspection system using drones coupled with on-board artificial intelligence processing technologies which can instantly analyze the potential defects (including cracking, breaking of concrete and water leakage, etc.) that may exist according the photo shot and generate report automatically. It greatly enhances the efficiency, precision and safety of the inspection operations. This innovation was conferred a Silver Medal at the International Exhibition of Inventions of Geneva 2022, and won the 2022 R&D (Research and Development) 100 Awards ("Software/Services" category), the latter is widely referred to as "the Oscars of Innovation".

Green and Smart Building

7. To promote low-carbon and environmental friendly building design, reduce the use of resources and to create a liveable, efficient and vibrant communities towards a more sustainable future, the Government is committed to adopting low-carbon, green and sustainable building design in government building projects throughout the entire lifecycle of a building from planning to design and construction, operation management and maintenance upon project completion, as well as renovation and demolition of a building. It is always a concern to address the impact on the environment and our citizens. Green building design and construction practices, compared to traditional practices, consumes less energy and water, thereby reducing greenhouse gas emissions. Recent government buildings in KE attained Platinum rating under BEAM Plus New Buildings included Kowloon East Regional Headquarters and Operational Base-cum-Ngau Tau Kok Divisional Police Station, Hong Kong Children's Hospital and the Kai Tak Sports Park.

8. The success in promotion of green and smart buildings relies on the establishment of good standard, and the joint efforts of the private sectors are also indispensable. To cater for the development of KE into a smart, green and resilient CBD, the Energizing Kowloon East Office (EKEO) has advocated the requirements of green buildings in new private development land leases. EKEO has pioneered the inclusion of requirements in new private development land leases for achieving

BEAM Plus accreditation of Provisional Gold or above rating, a higher greening ratio, provision of smart water meter system and electric vehicle charging facilities, and the sharing of real-time parking vacancy information at appropriate land sale sites in KE since 2015.

9. Currently, over 80 new private and public buildings in KE have acquired BEAM Plus Gold or above ratings from the Hong Kong Green Building Council, making KE with the highest density of green buildings in Hong Kong which significantly enhancing KE CBD's attractiveness.

Multi-functional Smart Lampposts

10. The Digital Policy Office (DPO) also launched the Multi-functional Smart Lampposts Pilot Scheme (Pilot Scheme) in 2019 to install Multi-functional Smart Lampposts (smart lampposts) with smart devices in locations with higher pedestrian and vehicular flow (including Kwun Tong and Kai Tak Development Areas) in the territory to collect real-time city data, as well as to support the development of digital infrastructure for 5G services. The Pilot Scheme was completed in December 2023. Currently, over 400 smart lampposts are in operation, including more than 80 located in KE. The real-time city data collected by the smart lampposts, such as meteorological data, air quality and traffic flow, etc., have been released as open data on the Government website (DATA.GOV.HK), facilitating the public to make use of the data for development of innovative applications. Making reference to the experience of the Pilot Scheme, the Government will install smart lamppost as a standard infrastructure in new development areas under planning or construction in future to facilitate B/Ds to install suitable smart devices and applications in accordance with their operational needs for enhancing city management and developing innovative services.

11. The other relevant initiatives of smart mobility including Smart and Green Transit System, Traffic Data Analytics System, Real-time Adaptive Traffic Signal System, Automated Parking System and Smart Public Transport Hubs were reported to the members of this Subcommittee at the Subcommittee meeting in October 2024. The relevant information were included in the LC Paper No. CB(2)1166/2024(01).

B. Smart Information and Data

12. Data collection and transmission are key elements in the development of smart city. The Government is proactively promoting the use of open data to

maximize the value creation for a livable, competitive, innovative, sustainable and smart city development through the provision of convenient, easily accessible, high quality and up-to-date spatial information and services.

CSTI Portal

13. Spatial Data Office (SDO) of the Development Bureau (DEVB), with the support from the Innovation, Technology and Industry Bureau (ITIB), has been promoting the development of Common Spatial Data Infrastructure (CSDI), which has collected more than 1,000 spatial datasets from over 60 departments and organizations for free download and free use by the public. Such information covers areas including maps, roads, traffic condition, land use, buildings, engineering and weather.

3D Digital Maps

14. Under the Government's policy support for smart city development, the Lands Department (LandsD) has used KE as trial to develop the first set of 3D Indoor Map since 2020. Together with the 3D Visualisation Map and 3D Pedestrian Network in KE, the 3D Digital Map for KE are in place. Compared to traditional 2D map, 3D Digital Map is more informative and detailed, enabling users to view the exterior features of buildings from different angles, take measurements and retrieve relevant geographical information, which supports a wider range of applications and analyses. The development of 3D Digital Map has progressively expanded to other districts, the full set of 3D Digital Map covering the whole territory of Hong Kong is expected to be completed in the first half of 2025.

3D Modelling Techniques and Smart City Planning

15. As 3D modelling technique has become increasingly mature and with the gradually launching of Hong Kong-wide 3D Digital Map since the pilot trial in KE, the Planning Department (PlanD) is currently using the advanced 3D modelling technology to provide strong support for the planning and decision making process. PlanD has created the 3D model of the proposed development project to precisely present the cityscape with the use of professional modelling software. The proposed development model could be combined with the 3D-Photo-realistic Model of the surrounding environment to generate highly realistic scenes through the high-tire photogrammetry software. It helps to assess the feasibility study of the proposed

development and the impact to the surrounding environment comprehensively and hence improving efficiency and accuracy of the decision-making process. In addition, the Statutory Planning Portal 3 (SPP3) has been launched since 2023 which combines with the Geographical Information System (GIS). Not only it could provide comprehensive planning information, but also integrates the geographical information of various departments to further enhance the transparency in planning.

Application of "Government-Wide IoT Network"(GWIN) in KE

16. Since 2019, the Electrical and Mechanical Services Department (EMSD) has established an Internet of Things (IoT) network across various districts in Hong Kong, known as the "Government-Wide IoT Network" (GWIN), to enhance delivery of public services and support various smart city initiatives. It uses LoRa (Long Range) technology, which has the advantages of wide coverage, low power consumption, low cost, and easy installation and maintenance. It provides a transmission network for data collected by sensors from various government departments (e.g. current, water leakage, etc.), supporting the development of a smart city. The system was first tested in Sha Tin and Kowloon East and gradually expanded to other regions of Hong Kong. As of February 2025, EMSD has installed 48 no. of GWIN fixed or mobile base stations in the KE, covering public transport interchanges, footbridges and tunnels, government offices, municipal buildings, fire stations and promenades, etc.

My Kowloon East (KE) Mobile Application

17. As a testing project of smart city initiative, EKEO has collaborated with the Lands Department in developing the My Kowloon East Mobile App (MyKE) since 2016 to establish an interactive information platform for KE to facilitate communication and share real-time data. The major function of MyKE launched by EKEO including “Easy Walking”, “Easy Parking” and “Easy Transport” can facilitate the public to commute. In 2021, EKEO collaborated with SDO, with the support from various Non-government Organizations (NGOs), MTR Corporation and some iconic shopping malls in KE, developed a spatial data enabled “Smart Navigation Tool for The Visually Impaired/People in Need” Proof-of-Concept providing barrier-free navigation experience for the visually impaired and people in need. This tool utilizes indoor maps to provide indoor and outdoor seamless navigation, which helps users easily navigate and interact with the environment, and increases users’ independence and mobility. In January 2023, this tool was incorporated into MyKE mobile application as the “Walking Assistant” function.

C. Smart City Co-Lab

18. Smart city development is a market with tremendous growth potential, offering unlimited business opportunities and helping to create numerous local entrepreneurship and employment opportunities. The KE CBD covering Kai Tai New Development Area, Kwun Tong, Kowloon Bay and San Po Kong Business Areas, which is located in a mix of new and old areas, making it an ideal testing ground. Apart from promoting various types of trials, EKEO has also facilitated the smart city development through close collaboration between public and private organizations and academia across the urban development cycle.

Collaborate with research institutes/universities and spearheaded innovative technology trials

19. EKEO has been adopting a collaborative approach to promote KE as a testing bed of smart city for various sectors and encouraging universities and research institutes to develop innovative smart city solutions. EKEO has in the past provided policy support for smart city-related research projects that using KE as a test bed in their funding applications and provided facilitation services to streamline the communications amongst various government departments and stakeholders. These include the research project "Smart Roadside Infrastructure to enhance Public Transport Capacity in Hong Kong" which EKEO providing support recently. The project acquired Smart Traffic Fund in June 2024 to commence the research for two years and planned for trial at Kai Tak Development Area in KE. The other research project that acquired support from EKEO for conducting trial in KE include "Robotaxi (Autonomous Vehicle)". Based on the study results, the Government will review the way forward on further promoting for adoption in other districts where appropriate.

Support STEM-Related Learning and Courses

20. EKEO also supports STEM-related learning and courses for secondary and university students through organizing exhibitions, workshops, briefings and competitions to engender cross-sector and multi-level collaboration and partnerships; and engages involving both local and overseas stakeholders in facilitating knowledge sharing, collaboration and co-creation of platform, to promote the smart city initiatives jointly. Examples include HKtag – Open Data Hackathon, Junior Achievement Hong Kong and HKU MSc in Electronic Commerce and Internet Computing Programme.

D. Development Strategies of Low-altitude Economy

21. The Government Work Report delivered in the second session of the 14th National People's Congress regarded the development of low-altitude economy (LAE) as one of the new growth engines. LAE, which refers to economic activities in airspace generally below 1 000 metres, presents a wide array of application scenarios including rescue, surveys and delivery of goods and passengers. The Government has established a Working Group on Developing LAE (Working Group), led by the Deputy Financial Secretary, to formulate development strategies and inter-departmental action plans.

22. The Government will collaborate with the industry and partner organizations to implement LAE Regulatory Sandbox (Sandbox) pilot projects progressively starting from this year. The first phase is expected to mainly cover operations involving smaller drones such as emergency and rescue, deliveries, inspection and maintenance, and surveillance, etc., with restrictions on "flying beyond visual line of sight" to be relaxed. The scope of low-altitude flying applications will be expanded and enriched progressively. The objective of the Sandbox pilot projects is to test various technical and ancillary facilities requirements under different scenarios, including the technical specifications of different types of unmanned aircraft and mobile radio communications network, etc. Through the implementation of the Sandbox pilot projects, the Government will review and enhance relevant civil aviation legislation, as well as design and plan future LAE air routes and supporting facilities for airspace management, thereby fostering the development of LAE in Hong Kong. The first batch of Sandbox applications has already ended in end of 2024, and the Working Group is currently evaluating the projects submitted by 72 applicants. The results are expected to be announced in the first quarter of this year, and the trials will commence subsequently. The Working Group has appointed the Hong Kong Productivity Council as the technical partner, and the Hong Kong Science and Technology Parks Corporation and the Hong Kong Cyberport Management Company Limited as the venue partners, in order to tap into the technical expertise of the trade and facilitate the implementation of the Sandbox pilot projects.

23. At the same time, the Government has also embarked on relevant work on various fronts, including legislative review, infrastructural planning and strengthening of interface with the Mainland, with a view to complementing the long-term development of Hong Kong's LAE.

Advice Sought

24. Members are invited to note this paper as a reference for detailed discussion.

Development Bureau
Transport and Logistics Bureau
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