

LCQ22: Applying innovative technologies in the management of public housing estates

Following is a question by Professor the Hon Priscilla Leung and a written reply by the Secretary for Housing, Ms Winnie Ho, in the Legislative Council today (June 4):

Question:

It is learnt that the Housing Department is actively promoting smart estate management, including employing drones to inspect lift shafts, external walls of buildings and pipes located beneath higher ceilings, utilising LiDAR-based localisation to capture images and analysing the images with artificial intelligence and thermal imaging technology to identify problems with the buildings, thereby reducing the risks of working at height and enhancing work efficiency. In this connection, will the Government inform this Council:

(1) of the number of public housing estates (PHEs) where drone technology is applied in day-to-day management at present, and its percentage in the total number of PHEs in Hong Kong; whether it has compiled statistics on the specific effectiveness of the authorities in enhancing maintenance efficiency and reducing incident risks (e.g. the time saved or the reduction rate of untoward incidents) since the implementation of smart estate management;

(2) as it is learnt that, prior to using drones for inspections, the management offices of the relevant PHEs will notify households in advance, and the system will automatically blur faces to protect household privacy, of the standard procedures for notifying households (e.g. the number of days of advance notification and the means by which the notification is made) and the operational details of the automatic face blurring technology; how the authorities will handle privacy-related complaints from households arising from drone inspections; and

(3) of the plans in place to further promote the application of drone technology and other innovative technologies in the management of PHEs (including the implementation timetable, the number of estates where such technologies will be applied, as well as an overview of the estimated expenditure and resource allocation)?

Reply:

President,

The Hong Kong Housing Authority (HA) is actively promoting smart estate

management through innovative technologies to enhance management efficiency and service quality; expedite the handling of maintenance of public facilities; strengthen hygiene and cleanliness; and enhance the sense of well-being and belonging among public rental housing (PRH) residents. In 2024, the HA selected ten public housing estates as pilot projects to proactively introduce suitable innovative technologies for smart estate management, such as the use of Internet of Things sensors, artificial intelligence (AI), mobile devices, and robots. In response to the questions raised by Professor the Hon Priscilla Leung, the reply is as follows:

(1) and (3) In the past, inspections of building facades or lift shafts required work staff to perform on-site work, with the former involving working at height and the latter involving enclosed spaces, which are relatively high-risk types of work. With the advancement of technology, the HA has introduced the use of drones to assist in estate maintenance works in PRH estates since 2023. Compared with the traditional long-distance visual inspections, the use of drones for inspections of building facade not only reduces the risks of working at height for works staff, but also provides clearer, quicker, and safer results. As for the use of drones for lift shaft inspections, compared with the traditional method of scaffolding or setting up work platforms inside the lift shafts for manual survey, use of drones not only reduces the risks of works staff entering and leaving the lift shafts, but also gains a more precise understanding of the issues, and shortens lift suspension time significantly, thereby minimising the impacts and inconvenience to the residents. Drone inspections also make it feasible to survey in high-level and enclosed lift shafts.

For building facade inspections, the HA's drone inspection contract covers all PRH estates in Hong Kong. To date, the service providers have completed the required facade inspections for about 20 PRH estates, with inspections in others are ongoing.

For lift shaft inspections, the HA has earlier successfully completed a trial use of drone inspections of lift shafts. Utilising the Light Detection And Ranging (LiDAR) positioning technology, the drone can be used by the site staff to conduct clear preliminary inspections and identify the necessary repairs at an early stage, such as concrete spalling and defects in electrical devices, and all can be more accurately displayed. Starting from early 2025, the HA has incorporated drone-based lift shaft inspection requirements in the consultancy contracts for lift modernisation projects. The HA also monitors the effectiveness of these inspections in improving maintenance efficiency and reducing accident risks, as well as collect the relevant data as the basis for further advancement in the future. The cost of drone inspections constitutes only a small portion of the overall estate maintenance and improvement works expenditures. Using drones to collect images and three-dimensional data can create detailed models, together with the AI algorithms, it allows a more precise identification of hard-to-reach defects. This enables works staff to co-ordinate the project and procure necessary materials more effectively, thus enhancing project efficiency. Additionally, using drones for inspections eliminates the need for scaffolding; shortens the inspection time and reduces the inconvenience

caused by the works to the residents. At the same time, site staff does not need to enter high-rise enclosed space to check various equipment conditions, which can improve workplace safety management and make the overall process more time-efficient and effective.

To further promote the application of innovative technologies in PRH estate management, the HA has established a dedicated co-ordination team to oversee the trial of various technologies across different management functions and review operational models, including updating workflows and manuals as well as providing appropriate training to staff. The HA will also launch a centralised property management platform within this year to optimise estate management operations through data analysis, so as to enhance management efficiency and improve service quality. The HA will closely monitor relevant technological developments and introduce more innovative technologies as appropriate to optimise estate management works.

(2) Drones used for facade inspections are normally equipped with cameras, infrared detection lenses, and range finders, performing tasks such as capturing images, recording videos, and/or measuring specific targets during flight of designated routes. Through the images collected by the drones, together with AI technology, it helps identify areas of concern for repairs. The estate offices usually issue notices to the residents concerned 14 days before the filming takes place, advising them to close windows and draw curtains during the filming period, so that the residents can be informed of the arrangement and prepared in advance.

Regarding the arrangement for using drones to inspect building facades, the HA has consulted the Office of the Privacy Commissioner for Personal Data (PCPD). The PCPD advised that drone operations in Hong Kong involving the collection, holding, processing, or use of personal data must comply with the Personal Data (Privacy) Ordinance (Cap. 486) and the relevant guidelines issued by the PCPD. In this connection, the HA has requested the service providers to formulate and strictly implement measures to protect residents' privacy in accordance with the PCPD's guidelines. Currently, service providers use AI to automatically detect and blur the portrait of a person, and ensure that no records containing identifiable images are retained, thereby safeguarding residents' privacy. Furthermore, these processes must be irreversible, and the system must not retain unprocessed original images.

The HA will endeavour to protect residents' privacy. If any related complaints are received, the Housing Department will handle them in accordance with established procedures.