

香港特別行政區政府  
商務及經濟發展局  
工商及旅遊科



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**COMMERCE AND ECONOMIC  
DEVELOPMENT BUREAU**  
GOVERNMENT OF THE HONG KONG  
SPECIAL ADMINISTRATIVE REGION

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TAMAR, HONG KONG

17 May 2021

Clerk to Panel on Economic Development  
Legislative Council Secretariat  
Legislative Council Complex  
1 Legislative Council Road  
Central  
Hong Kong  
(Attn: Ms Shirley CHAN)

Dear Ms CHAN,

Thank you for your letter dated 26 April 2021 on the follow-up item arising from the Panel on Economic Development's discussion of the Hong Kong Observatory (HKO)'s proposal to replace two existing long-range Light Detection and Ranging (LIDAR) Systems and to procure new wake turbulence detection equipment for the existing North and South Runways of the Hong Kong International Airport (HKIA). Supplementary information regarding the need to advance the replacement schedule of similar LIDAR Systems installed in other airports outside Hong Kong that are more susceptible to sandstorms is provided below for Members' reference.

HKO is the first meteorological authority in the world to utilise long-range LIDAR Systems to detect windshear under non-rainy conditions in airport. According to information available to HKO, there are currently only a limited number of airports utilising long-range LIDAR Systems to detect windshear, and amongst them, even fewer are located in areas that are more susceptible to sandstorms. HKO is only aware of two such airports that may be relevant, i.e. the Beijing Daxing International Airport and Las Vegas McCarran International Airport. HKO has approached the respective authorities of these airports for information on the operation of their long-range LIDAR Systems.

Based on the information provided by the two relevant authorities and collected by HKO, the impact of construction sand and dust on HKO's LIDAR Systems at the HKIA is not directly comparable to that of the sandstorms. Sandstorms usually take place during periods of low humidity and strong wind, where the majority of small-sized sand are blown far away, and large-sized sand are less likely to adhere to the equipment. In addition, sandstorms are normally short-lived and their impact on a single location generally lasts for a few hours only. Given the two concerned airports are more susceptible to sandstorms, the long-range LIDARs they used are with sand resistant designs.

By contrast, sand and dust from the nearby Three Runway System construction works have a more long-lasting effect on the LIDAR Systems at the HKIA due to the close proximity of the work sites and the long duration of the construction works, which inevitably accelerates the deterioration of the bearings, gears and optical amplifiers of the LIDAR Systems, thus affecting the equipment's pointing accuracy and performance. This is particularly the case once the works for reconfiguring the existing North Runway into the Centre Runway commences in mid-2022, as the relevant construction sites are located even closer to the two existing LIDAR Systems. Given Hong Kong's humid subtropical climate, fine construction sand and dust would more likely adhere to the LIDAR Systems, intensifying the associated adverse impact on the equipment.

The existing long-range LIDAR Systems will reach the end of their typical serviceable periods by March 2026. HKO has considered only replacing the parts of the Systems affected by the construction sand and dust, but this could only extend the serviceable period by a relatively short period of time and is not cost effective. HKO will nevertheless step up cleaning and maintenance of the existing LIDAR Systems and continuously monitor their performance. HKO will only replace the existing LIDAR Systems when their performance and reliability are no longer sufficient to provide windshear alert services, or when they reach the end of their typical serviceable periods by March 2026.

Yours sincerely,



(Ronald CHOI)

for Secretary for Commerce and Economic Development