

The Hong Kong International Airport (HKIA) at north Lantau, which opened for commercial operations in 1998, is a vital component of Hong Kong's economy, serving both tourism and commerce. Its strategic position in Asia has made it an important regional trans-shipment centre, passenger hub and gateway to other Chinese cities.

The airport has two runways in operation. The extension of Terminal 1 has been operational since November 2019, adding a new aisle with 48 check-in counters, two additional baggage reclaim carousels, catering kiosks, offices and other services.

The HKIA serves as one of the busiest airports in the world, with around 120 airlines providing direct services to around 150 destinations worldwide. Prior to the outbreak of the COVID-19 pandemic, the HKIA recorded continuous growth and handled about 71.5 million passengers, 4.8 million tonnes of air cargo and around 420 000 air traffic movements in 2019. The impact of the COVID-19 pandemic which has hit and affected the global air transport industry severely continued through 2021. The HKIA handled only about 1.4 million passengers and around 145 000 air traffic movements in 2021. Nevertheless, there was a slight increase in air cargo handled in the year which amounted to about 5 million tonnes. The air transport industry is working closely together to prepare for the resumption and recovery of air traffic post the COVID-19 pandemic challenges.

Administration: In 2021, there were around 120 airlines providing services between Hong Kong and around 150 destinations worldwide.

The Civil Aviation Department (CAD) is responsible for the provision of air traffic control services, certification of Hong Kong registered aircraft, monitoring of airlines on their compliance with bilateral Air Services Agreements, the regulation of general civil aviation activities and overseeing the safety and security of airport operations. The Airport Authority Hong Kong (AAHK) is required to ensure the operations of HKIA comply with the safety and security requirements of CAD in order to obtain an Aerodrome Licence from CAD for operating the Airport.

Runways and Parking Aprons: The south and the north runways are both 3 800 metres in length and 60 metres wide enabling them to accommodate A380 aircraft. The south runway is equipped with a Category II Precision Approach, while the 25R direction of the north runway is equipped with a Category I Precision Approach. The 07L direction of the north runway has the higher Category III rating, which allows pilots of wide-bodied aircraft to land in as low as 100-metre visibility. The handling capacity of the two runways is 69

aircraft movements an hour. The centre runway is being closed for reconfiguration until the full commissioning of the Three-runway System targeted for 2024.

At present, there are 77 frontal stands, 42 remote stands and 55 cargo stands. Among them, eight frontal stands are capable of accommodating the A380.

Passenger Facilities: HKIA is one of the most accessible airports in operation today. Despite its size, the passenger terminals are designed for maximum convenience. A simple layout and effective signage, moving walkways and the automated people mover allow quick and easy movement throughout the buildings. Facilities for the disabled are provided up to statutory requirements and code of practice. The airport is also served by a complete transport system operational round-the-clock. The fully integrated ground transportation centre is conveniently located adjacent to the passenger terminals. It provides immediate access to and from the airport express train as well as other public transport services such as buses, coaches, hotel limousines and taxis.

Baggage and Ramp Handling: Quality ramp handling services are provided by Hong Kong Airport Services Limited, Jardine Air Terminal Services Limited and SATS Hong Kong Limited. Their services include handling of mail and passenger baggage, transportation of cargo, operations of aerobridges and passenger stairways. The airport has an advanced baggage handling system (BHS), the main section of which is located in the basement level of the passenger terminal, and two separate remote transfer facilities at the western end of the main concourse and T1 Midfield Concourse for handling of tight connection transfer bags. The BHS processes departure, arrival and transfer bags and utilises a conveyor of 33 kilometres long. Bar coding and RFID scanners read the standard International Air Transport Association baggage labels and route bags to their destinations. Majority of the arrival bags are conveyed to 14 reclaim carousels within 20 to 40 minutes from aircraft landing.

Air Cargo: HKIA handled about 5 million tonnes of cargo in 2021. The airport currently has world-class cargo handling facilities. Hong Kong Air Cargo Terminals Limited operates the SuperTerminal 1, one of the world's largest air cargo handling facilities. Occupying a total land area of about 17 hectares, the terminal's designed handling capacity is 2.6 million tonnes of freight a year. Another service provider is Asia Airfreight Terminal Company Limited, whose terminal has a designed handling capacity of about 1.5 million

tonnes a year. The 11-hectare Cathay Pacific Cargo Terminal has a designed throughput of 2.6 million tonnes a year. DHL's 3.5-hectare Central Asia Hub at HKIA can handle more than 35 000 parcels and 40 000 documents per hour. It is undergoing an expansion and is expected to increase its capacity by 50% upon completion. In addition, with a total land area of about two hectares, Hongkong Post's Air Mail Centre handles 700 000 items of mail every day. The Government has earlier announced the plan to redevelop the Air Mail Centre to further enhance its handling capability. In parallel, a premium logistics centre is being developed at HKIA, which is expected to add 1.7 million tonnes of cargo volume to HKIA each year when it operates in full capacity.

Aircraft Maintenance Services: Hong Kong Aircraft Engineering Company Limited (HAECO) and China Aircraft Services Limited (CASL) provide both line and base-maintenance services and Pan Asia Pacific Aviation Services Limited (PAPAS) provides line maintenance services.

Line maintenance services include routine servicing of aircraft performed during normal turnaround periods and regular scheduled layover periods. Base maintenance covers all airframe maintenance services and, for this, HAECO has three hangars with 22 maintenance positions capable of accommodating a wide range of commercial aircraft types simultaneously, with adjoining support workshops. CASL has a hangar which could accommodate one wide-bodied and one narrow-bodied aircraft at the same time with adjoining support workshops.

Air Traffic Control Services: With the full commissioning of the Air Traffic Management System (ATMS) and commencement of the operational familiarisation of the Third Runway of the HKIA, all the major systems in East Air Traffic Control (ATC) Centre (E-ATCC), South ATC Tower and ATC Tower beside the Third Runway have been put in operational use.

The ATC System is designed to meet the international safety standards and ATC operational requirements. With an enhanced capacity and state-of-the-art system design, the system can handle the projected air traffic growth, including that to be brought about by the development of the Three-runway system at the airport.

Satellite-based Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) Systems:

To comply with the International Civil Aviation Organization (ICAO) Global Air Navigation Plan, extensive studies and trials on certain CNS/ATM system elements have been conducted by CAD. Currently some CNS/ATM services have been implemented at HKIA to enhance ATC operational efficiency and flight safety. These include:

- Digital-Automatic Terminal Information Service;
- Digital-Meteorological Information for Aircraft in Flight;
- Delivery of Pre-Departure Clearance Two-way

Datalink Service;

- Aeronautical Telecommunication Network and Air Traffic Services Message Handling System operations with Bangkok, Beijing, Fukuoka, Macao, Manila and Taipei;
- Air Traffic Services Inter-facility Data Communication with Area Control Centres of Guangzhou, Sanya, Manila and Taipei;
- Advanced Surface Movement Guidance and Control System for enhanced surveillance of aircraft and vehicle movements on the airfield; and
- Arrival Manager System which assists the air traffic controllers in the planning for an optimum landing sequence and more efficient use of airspace.

Automatic Dependent Surveillance – Broadcast (ADS-B) and Ground-Based Augmentation System (GBAS):

In order to derive the most benefit from the new aviation technologies, CAD has implemented the Automatic Dependent Surveillance – Broadcast (ADS-B) within the Hong Kong Flight Information Region (HKFIR). CAD commissioned eight ADS-B ground stations for the surveillance for both high-level and low-level flying aircraft and helicopters within HKFIR. In addition, an ADS-B data analysis system was developed to monitor and analyse data from ADS-B equipped aircraft, for enhancing the aviation safety within HKFIR.

GBAS provides differential corrections and integrity monitoring of Global Navigation Satellite System for supporting approach and landing of aircraft. CAD has been working closely with the Lands Department in establishing a territory-wide satellite positioning database since 2012 and collaborating with neighbouring areas in the Asia and Pacific Regions to assess ionospheric effect on GBAS performance as well as its optimal installation locations. CAD successfully conducted a GBAS trial at HKIA in end 2018 with positive feedbacks from participating pilots. The experience gained provided a valuable reference for the GBAS deployment at HKIA in future.

Collaborative Decision Making (CDM): CDM is a joint government/industry project aiming to enhance efficiency in air traffic operations through real-time information exchange among aviation community stakeholders. CAD rolled out a Phase 1 CDM service in both desktop PC and mobile versions in July 2013, which was well received by the industry. To cope with the continuous growth of air traffic movements, AAHK launched the Phase 2 CDM system and new pre-departure procedures in July 2017. Since the commencement of full CDM operation from November 2018, CAD has been working closely with AAHK to improve the pre-departure sequencing of the system and ATC procedures to further enhance the reliability of the Target Startup Approval Time. Further enhancement in departure release mechanism was adopted in December 2020 and together with the relentless effort from all stakeholders, the on-time performance of departure flights and overall airport

efficiency had been further improved.

Digital Tower Facilities (DTFs): DTFs are equipped with ultra-high resolution surveillance cameras with video recognition technology to provide real-time digitised panoramic views of the airport. Aircraft and vehicles images shown on those panoramic views are augmented with corresponding flight information. Artificial intelligence is applied to the digitised video to provide additional safety alert functions, such as early detection of conflicting situation or intrusion to airfield restricted areas. Phase 1 of the DTFs was commissioned as planned to support operational familiarisation of the Third Runway of the HKIA for further enhancing the overall efficiency and situation awareness of air traffic controllers.

Weather Services for Aviation: Airport Meteorological Office (AMO) of Hong Kong Observatory (HKO) provides weather services for the aviation community in accordance with the standards and recommended practices of ICAO and World Meteorological Organization. AMO makes routine and special weather observations and provides aerodrome forecasts and landing forecasts for HKIA. It issues aerodrome warnings on thunderstorms, strong surface winds, tsunami, and other hazardous weather and events for protection of personnel, aerodrome facilities and aircraft on the ground. It also issues significant weather information on thunderstorms, tropical cyclones, turbulence, icing, volcanic ash and other hazardous weather which may affect aviation safety within HKFIR. To enhance the safety of aircraft landing and taking off from HKIA, AMO issues alerts of low-level windshear and turbulence. It also provides tailored weather information over and near the airport to support ATM operation and operates the Airport Thunderstorm and Lightning Alerting System to support the Red Lightning Warning at the airport. For service delivery, HKO operates a web-based information service through which airlines and pilots can retrieve the latest meteorological information and flight documentation including weather forecasts for departure, destination and alternate aerodromes, forecast charts of en-route significant weather, wind and temperature data, lightning location information, weather radar and satellite images, as well as information on strong convective weather near the airport. HKO also provides an Electronic Flight Bag application, MyFlightWx, for pilots to assimilate flight specific weather information in the cockpit. Apart from serving local aviation community, as the backup centre of the Asian Aviation Meteorological Centre, HKO also makes hazardous weather advisory products available for nearby aviation meteorological units.

Rescue and Fire Fighting Services: Such services within the airport are provided by Airport Fire Contingent of Fire Services Department. The contingent has a strength of about 260 uniformed members, operating two airside fire stations and two sea rescue berths for 24-hour emergency services.

It is equipped with 14 fire appliances which can respond to incidents occurred at any point of operational runways within two minutes in optimum conditions of visibility and surface conditions, satisfying the relevant recommendation of ICAO. Two high capacity Command Boats, supported by eight speed boats, form the core of sea rescue operations.

Developments at the Airport: Airport business is the management of flows: the flows of passengers, cargo and information. To sustain the growth of flows, HKIA continues to expand its connections to new sources of passengers and cargo. This means improving the network to the rapidly-growing markets in Mainland China, in particular the Greater Bay Area (GBA).

HKIA offers travellers extensive land and sea connections to cities throughout the GBA, including coaches and ferry services. Passengers can take coaches to over 110 GBA cities and destinations or enjoy point-to-point transport cross-boundary limousine services for their GBA destinations.

Meanwhile, the SkyPier serves nine GBA ports, namely: Shekou and Fuyong of Shenzhen, Maritime Ferry Terminal and Taipa of Macau, Humen of Dongguan, Zhongshan, Zhuhai, Nansha and Lianhuashan of Guangzhou. Passengers of both directions can bypass customs and immigration formalities at HKIA and save transit time. To further streamline the travelling process at the border, HKIA has launched an upstream check-in service at all ports for sea-air passengers. Passengers can obtain their boarding passes and check-in their baggage before arriving at HKIA. The provision of cross-boundary coach, limousine and ferry services has transformed HKIA into a truly multi-modal transportation hub combining air, sea and land transport serving the region.

Air Services: The operation of scheduled air services to and from Hong Kong is facilitated by Air Services Agreements between Hong Kong and its aviation partners. Since the opening of HKIA, the Hong Kong Special Administrative Region Government has firmly and proactively implemented a policy of progressive liberalisation of air services to promote consumer choice and competition and to provide airlines of Hong Kong and its aviation partners with opportunities for service expansion.

Commercial Aviation, Recreational Flying and the Government Flying Service: In 2021, there were around 320 aircraft registered in Hong Kong. A majority of these aircraft were operated for commercial services by eight airlines granted an Air Operator's Certificate by the CAD. Such aircraft include A300, A320, A321, A330, A350, B737-800, B747, B777 as well as AW139 and MD900 helicopters.

Hong Kong Business Aviation Centre (BAC) is located within the confines of the airport and has its own terminal and facilities. It provides a full range of services for executive aircraft around the clock, including ground handling, baggage handling, fuelling, security and flight planning. Designated spaces are also provided at BAC for private aircraft.

Among the aircraft registered in Hong Kong, around 20 helicopters and aeroplanes are registered by non-commercial operators for recreational flying purposes. These helicopters and aeroplanes include R22, R44, R66, C152, C172, C182, EA 300/L.

The Government Flying Service provides round-the-clock flying services, including search and rescue, internal security support, emergency air ambulance service and fire-fighting operations. It also provides services to support the work of various government departments. It has a fleet of 12 helicopters and aeroplanes comprising of H175, EC155, CL605 and DA 42 NG.