As one of the world’s busiest airports, Hong Kong International Airport (HKIA) uses the latest technologies and state-of-the-art infrastructure to ensure safe, efficient airfield operations.

APPLYING NEW TECHNOLOGIES

We leverage technology to enhance various aspects of airport operations.

After conducting trials of different methods for detecting cracks in airfield pavement, in March 2019 we implemented a system that uses lasers, high-speed cameras and advanced optics to acquire both images and high-resolution, three-dimensional profiles of the pavement surface. The new system strengthens airfield safety by automatically identifying pavement problems—including cracks, potholes and ruts—and rating the severity of each defect.

The growing popularity of drones and other unmanned aircraft systems (UASs) poses risks to airport safety. In 2018/19, we conducted a study on the technical feasibility of applying UAS detection systems at HKIA with the Civil Aviation Department (CAD). In addition to existing protection measures, we are now exploring an enhanced system for use at the airport.

During the year, we increased the efficiency of our maintenance operations by automating a storeroom that keeps spare parts for airport systems and facilities. Staff can now use a mobile app to request spare parts, which will be delivered by a robotic system. A facial recognition system validates the staff’s identity before the parts are released.

We also take advantage of technology to streamline manual processes. In July 2018, we tested an automatic air bridge positioning and retraction system in Terminal 1. The new system automates most of the air bridge docking and retracting process, which occurs under an operator’s supervision. Additional tests will be conducted in the North Satellite Concourse and Midfield Concourse, with airport-wide introduction planned for 2019/20.

An automated storeroom for spare parts allows better inventory management and maintenance efficiency.
HKIA plans to install an automated system for positioning of air bridges to reduce manual works.

This year, we procured a new, automatic aircraft parking stand allocation system. After user acceptance testing and training, the new system is scheduled for implementation in May 2019.

In 2018/19, we continued phase one development of the Augmented Airfield System, also known as AS2. The system uses “Internet of Things” (IoT) technology to track ground handling activities. Phase one of the programme focuses on tracking baggage offloading, which is one of HKIA’s key performance indicators. Data from phase one will be evaluated for further development of AS2, which will cover a wider spectrum of ground handling activities, such as aircraft fueling, maintenance, baggage uploading and cargo operations. These activities will undergo data analytics with the aim of optimising the allocation of airfield resources. We also plan to apply IoT technology—which allows instant and continuous monitoring—to predictive maintenance of airport infrastructure, including the Automated People Mover, rainwater drainage, airfield guidance signage and more.

INTRODUCING NEW ASSETS

As HKIA’s passenger numbers have increased, so have baggage volumes. To maintain the well-being and safety of baggage handling staff, in 2018/19 we conducted a three-month trial of an unloading aid that is installed at the infeed dock of arrival belts. We are now sourcing the most suitable model for installation on all arrivals and transfer belts.

INCREASING RUNWAY CAPACITY

Airport Authority Hong Kong (AAHK) is working closely with the CAD to increase the runway capacity of HKIA’s existing two-runway system.

A new capacity management solution, Performance-based Capacity Declaration (PBCD), is being studied by the CAD and AAHK. With the purpose of balancing operational demands on key airport infrastructure elements, the solution utilises simulation software, Strategic Airport Capacity Management (S-ACM), to take a range of aircraft operational performance
characteristics into consideration when formulating forecast flight schedules and assessing their corresponding impact on overall air traffic. Trials of S-ACM began in the first quarter of 2019.

During the year, we also formed a task force with the CAD and the Hong Kong Observatory to study the feasibility of implementing Wake Vortex Re-categorisation (RECAT) separation minima between aircraft to achieve efficiency gains at HKIA. RECAT is an aircraft categorisation methodology that aims to marginally increase the arrival and/or departure capacity at airports by redefining the wake vortex categories of aircraft without compromising air traffic safety. If successfully implemented, RECAT will have a positive effect on enhancing runway capacity and could reduce airborne delays at HKIA.

INDUSTRY COLLABORATION

The International Airport Benchmarking Programme, a platform for hub airports to share key performance indicator data, improvement opportunities and new ideas, includes HKIA, London Heathrow, Toronto Pearson, Los Angeles, Munich and San Francisco. In 2018/19, the number of participants grew to nine with the addition of Sydney, Paris-Charles de Gaulle and Amsterdam Airport Schiphol.

In November 2018, the programme marked a milestone as AAHK hosted the first Mega Hub Airports–CEO Summit, where senior executives from the nine airports discussed issues of common interest, such as enhancing the passenger experience and boosting operational efficiency, and identified collaboration opportunities.