TERMINAL TECHNOLOGIES

Airports are working more than ever to ensure passengers receive a pleasant travel experience, and innovative technology is being deployed throughout many of the world's busiest terminals to help achieve customer service excellence. This In-Depth Focus explores some recent digital and innovative developments that are helping to transform the airport experience.

Technology drives customer service at Halifax Stanfield International Airport

Halifax Stanfield International Airport is well known for its hospitality and customer service, consistently ranking among the best airports in the world. In an interview for *International Airport Review*, Halifax International Airport Authority's *Craig Paul*, Director of Business Solutions and Information Technology, explains that the foundation of the airport's approach is 'The Stanfield Way' – a distinctive airport service culture programme.

"**A**IRPORTS are emotional places," says Craig. "We never want to lose sight of that, so we have embraced a culture of superior service and work hard to make Halifax Stanfield a place where everyone feels welcome, relaxed and safe, every day. And it's a community effort."

A big part of that commitment to customer service is utilising the latest and greatest technology available, and Atlantic Canada's largest airport has a long-standing history of being an early adopter of technology to improve the passenger experience.

Halifax International Airport Authority (HIAA) is the locally controlled, non-share capital corporation that manages and operates Halifax Stanfield. Entrenched in its strategic plan is a focus on both customer service and technology.

"We identified customer-service culture as one of our four foundation elements and maximising airport efficiency as a strategic priority," says Craig. "Formalising our commitment to efficiency through technology in this way ensures we will have the resources we need to succeed."

And Halifax Stanfield has a made a little history along the way.

"In 2007, we were the first major airport in Canada to provide free wireless internet services in our terminal building," says Craig. But that was only the beginning.

First moving sidewalks

In 2009, Halifax Stanfield opened a new parking structure, and with it Nova Scotia's first moving sidewalks connected it to the terminal building.

"This addition to our facility provides easier and faster access to and from our Parkade," says Craig. "Travellers, especially those with mobility issues, have the highest level of service at the airport."

To make way for the new vertical circulation components in the terminal building, the old escalators were replaced. What makes that noteworthy is that they too were trailblazing. After almost half a century of service, and millions of revolutions, Nova Scotia's first escalators were retired.

Self-service baggage – a first in North America

In 2014, Halifax Stanfield became the first airport in North America to offer self-service baggage drop for all passengers.

The new, fully automated, self-service baggage drop system utilised the latest technology to simplify the check-in process for airline passengers. This

improved level of service speeded up the check-in process and reduced the time spent in queues.

HIAA worked closely with its airline partners to develop this new passenger processing model.

Similar self-service processes had been in use by some airlines in airports in other areas of the world. "We saw this as an opportunity to be an industry leader, offering an enhanced, time-saving service to our passengers," says Craig.

The new baggage drop system was part of a larger project that saw modernisation of the baggage handling and screening equipment and renovations to the terminal building, to upgrade and expand both the domestic/international and U.S. preclearance check-in halls.

New baggage handling system

A new, state-of-the-art baggage handling system was also installed. Its space-saving design delivered higher capacity, more sophisticated baggage handling capabilities, and the latest baggage screening technology for domestic, international, and U.S.-bound passengers. ▶

MAIN IMAGE:
Check-in kiosks at Halifax Stanfield

1 Self-serve baggage drop is available at Halifax Stanfield

2 BorderXpress Automated Passport Control (APC) kiosks at Halifax Stanfield

3 Behind the scenes: Halifax Stanfield's state-of-the-art baggage handling system

4 The TRAX® SmartRestroom system helps deliver superior customer experience

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We are continuously looking for innovative ways to improve the airport experience of our passengers

BIOGRAPHY

CRAIG PAUL is responsible for managing the technology used to facilitate passenger travel, providing vision and leadership in Halifax International Airport Authority's information technology environment, including strategic and tactical planning, development, evaluation and coordination of activities. Craig facilitates the planning and implementation of enterprise information systems to support both airport and business operations, and is also responsible for overseeing the management of multiple information and communications systems and projects. Craig has over 23 years of experience within the technology and transportation industries and holds a Bachelor of Commerce Degree with a major in Computer Information Systems from Saint Mary's University.

"We worked collaboratively with our baggage system contractor, Buemer Group, the Canadian Air Transport Security Authority, and U.S. Customs and Border Protection to install this new state-of-the-art system," says Craig. "With increased capacity, enhanced safety and security, and improved efficiency, this system will serve us well for years to come."

Impressively, the fully-automated system cuts the average check-in time from about 10 minutes to less than two. With almost two million departing passengers checking two million pieces of luggage through the airport annually, those reduced waiting times are saving passengers thousands of hours – time they can use to shop, read or simply relax.

The airport's position as an industry leader was recognised when it received a national Ingenious Award. The baggage system was named one of Canada's most innovative technology achievements in 2014 by the Information Technology Association of Canada.

Renovated terminal building

Both the domestic/international and U.S. preclearance check-in halls were renovated at the same time to create more room for passenger flow, new equipment and processes, and future growth.

At the domestic/international check-in end of the terminal building, a contemporary look for the building exterior has altered the airport landscape. The two-story glass façade brought natural light into the space with architecture that was consistent with the rest of the terminal.

All of these improvements were part of HIAA's long-term capital plan. "As a key driver in regional economic growth, it's vital to ensure Halifax Stanfield continues to meet the needs of our current and future passengers and visitors, and adapts to the ongoing requirements of our airline partners," says Craig.

Quicker at the border

In 2016, seven BorderXpress Automated Passport Control (APC) kiosks were installed in the U.S. preclearance area at Halifax Stanfield. The new kiosks help U.S. Customs and Border Protection officers process more passengers than traditional clearance methods, reducing congestion and decreasing waiting times.

The new kiosks are both secure and efficient. By automating the administrative portion of the U.S. Customs and Border Protection process, the APC technology makes the process speedy and smooth for passengers.

Passengers proceed directly to a self-service kiosk in the U.S. Customs and Border Protection area, follow the on-screen instructions to scan their passport and answer customs declaration questions, then receive a receipt confirming their information and continue to a U.S. Customs and Border Protection officer to finalise processing.

In October 2017, the Canada Border Services Agency (CBSA) introduced similar technology and benefits for passengers entering or returning to Canada with 24 Primary Inspection Kiosks (PIK) and an eDeclaration mobile app. The kiosks are next generation technology that offer self-service options for international air travellers arriving in Canada at Halifax Stanfield.

Much like the APC kiosk process at U.S. Customs, passengers proceed directly to the PIK kiosks to verify travel documents and complete an on-screen declaration. PIK also uses facial authentication (involving a one-to-one photo comparison at the kiosk with the traveller's passport) to confirm identity. Those looking to save more time can complete their declaration in advance using the CanBorder – eDeclaration mobile app, which will give them a quick response code to scan at a kiosk upon arrival. Halifax Stanfield was the fifth Canadian airport to launch the PIK technology in 2017.

Craig says: "We are continuously looking for innovative ways to improve the airport experience of our passengers. We were delighted to collaborate with Canada Border Services Agency and launch this enhancement for the benefit of returning residents and arriving visitors."

TRAX® SmartRestroom

In October 2017, Halifax Stanfield became the first Canadian airport to implement an Infax TRAX® SmartRestroom system.

"This new system is helping us continue to deliver on its commitment to superior customer experience through early adoption of innovative technologies," explains Craig.

The pilot solution includes throughput counting, predictive data, cleaning alerts and customer survey tablets, which are located at the exit of the two washrooms in domestic arrivals.

The SmartRestroom user interface allows the airport to view survey results and real-time passenger analytics. Airport Authority staff can see feedback left by passengers and immediately take care of the problem before it escalates.

Craig adds: "We are very pleased with the quality of data we are receiving from the TRAX® SmartRestroom solution. Having a system that provides both real-time and predictive data is a key differentiator for improving our operational efficiency and managing washroom cleanliness."

Halifax Stanfield's pilot system marked the sixth SmartRestroom project for Infax. With more projects in the works and plans for system expansion, the solution is proving to be a revolutionary tool for improving business operations and the customer experience.

ABOUT HALIFAX STANFIELD'S SELF-SERVICE BAGGAGE DROP SYSTEM, JON QUINTON, STATION MANAGER FOR WESTJET IN HALIFAX, COMMENTED:

"We welcome any airport improvements that enrich the travel experience for our guests. The new system helps travellers move through the check-in process more quickly, and frees up our team members to get out from behind the counters and assist those guests who need a little extra attention."

What's next?

"As part of our ongoing commitment to improve collaboration and communication within our organisation, we have launched a new project to refresh our traditional data file management and employee intranet by adopting Microsoft Office 365 services and SharePoint," says Craig.

Enterprise Content Management (ECM) is a formalised means of organising and storing an organisation's documents, images, records, videos and other content that relate to the organisation's processes. The term encompasses strategies, methods and tools used throughout the lifecycle of the organisation's content.

Halifax Stanfield offers the very best in facilities and services to its passengers and visitors by employing the latest technology.

Craig finishes: "The only way to create the airport of tomorrow – our ultimate goal – is with the technology of the future. We're proud to bring industry-leading processes to Halifax Stanfield and believe they are a testament to our customer service commitment."

ABOVE: Moving sidewalks connect the Parkade to the terminal building

Transforming
the airport experience

For *International Airport Review*, *Raoul Cooper*, Airport Transformation Design Manager for British Airways, takes a look at the latest innovative technology deployed by the UK's largest global airline at terminals to help transform the airport experience for its customers.

ABRITISH Airways aircraft takes off from somewhere in the world, every 90 seconds. The UK's largest global airline employs more than 45,000 colleagues and operates to more than 200 destinations, in over 75 countries across the globe. British Airways operates from four of London's biggest airports and flies up to 145,000 customers every day.

At the heart of our operation will always be our people – that won't change, whatever advancements are made with technology, because we know our customers want to see a smiling, helpful face as they make their way through the airport, and have someone close by to ask questions. We know how important this is and will always maintain that presence – but at the same time we are actively embracing innovative use of technology to benefit our customers.

When our home hub at London Heathrow's Terminal 5 opened in 2008, it offered the latest state-of-the-art technology and was created with the specific premise of making air travel easy through one of the world's busiest airport hubs. We invested £330 million in designing and equipping Terminal 5, including a significant investment in IT systems, ground vehicles and equipment, storage and maintenance facilities. Since then, investment in cutting-edge technology has continued, and in 2017 we opened a new First Wing for British Airways Gold Executive Club members and customers travelling in first class – an exclusive check-in area and security channel which leads directly into our First lounge.

At the beginning of 2017 we welcomed customers to our fantastic new home in the South Terminal at Gatwick which has a larger, brighter check-in area and a fantastic new lounge – as well as self-service bag drop facilities.

We know that frequent flyers want to travel without touching the sides at the airport – and benefit from the advantages of self-service technology – in the same way they do when taking public transport in the city and in the supermarket. Our aim is for customers to have a seamless experience when they travel with us. Today, 75 per cent of customers travelling from the UK use BA's self-service channels to check-in – and the majority arrive at the terminal ready to ▶

LEFT: BA self-service boarding gates at London Heathrow

> *Across Heathrow and Gatwick airports, we are rapidly increasing the number of self-service bag drop points, so many customers simply drop their bags and head for the security channels. By the end of 2018, we will have almost 200 in use across our operation*

BIOGRAPHY

RAOUL COOPER has worked in aviation for more than 20 years in various fields – including commercial, operations, and IT. In his role at British Airways, Raoul manages the strategic direction for what the airline terms 'Airport Transformation', developing innovative technology solutions to improve customer experience at the airport. By putting digital transformation at the heart of new ways of working, his aim is to put British Airways customers in complete control of their own journey.

1 Eco-friendly Mototok tugs allow BA ground staff to prepare aircraft for departure much more efficiently

2 BA is the first UK airline to introduce automated biometric technology at London Heathrow with the launch of self-service biometric boarding gates

3 BA self-service bag drop facilities

fly. Across Heathrow and Gatwick airports, we are rapidly increasing the number of self-service bag drop points, so many customers simply drop their bags and head for the security channels. By the end of 2018, we will have almost 200 in use across our operation.

Biometric boarding

We are excited that we're the first UK airline to introduce automated biometric technology throughout the airport with the launch of self-service boarding gates. Following a successful trial, everyone flying on domestic flights departing from Heathrow Terminal 5 can board using facial-recognition technology. We know how important it is for our customers that their flights depart and arrive on time, and this technology has helped improve our boarding punctuality on domestic flights by 10 per cent.

And we're not just testing out this technology in the UK. Right now, we're trialling self-service biometric boarding gates on international flights out of the U.S., working in partnership with Los Angeles International Airport. Customers will no longer need to present their passport or boarding pass at the gate – only at check-in and security. Instead, travellers can simply look into a camera prior to boarding, have their biometric data verified, and then walk onto the aircraft. Similar to facial identification built into mobile phones, the biometric gates use high-definition camera technology, and allow customers to pass through by recognising their unique facial features, and reconciling them with the digital facial scan taken as part of the immigration process. Working in partnership with the U.S. Government and the Customs and Border Protection Agency to develop and approve the

We know our customers have high expectations, especially when it comes to technology, so we will continue to seek opportunities to transform their journey through the airport

scheme, we've made great advancements, and we are giving customers a taste of what they can expect in the future.

Remote controlled pushback vehicles

Biometric boarding isn't the only way we're improving punctuality. Heathrow is one of the world's busiest airports (the busiest in Europe by passenger traffic) and an aircraft takes off / lands every 45 seconds. Every second counts for us and we're constantly looking for ways of improving efficiency. Some of the technology we're using, customers won't see – such as our high-tech remote controlled Mototok pushback vehicles. We're the first airline in the world to introduce these, and we're using them across our short-haul operation. These eco-friendly Mototok tugs allow our ground staff to prepare aircraft for departure much more efficiently. They replace traditional diesel tugs, allowing a single ramp agent to push an aircraft backwards from the gate remotely. Emissions-free and capable of moving planes with precision, more than 750,000 customers have benefited from smoother departures already. And, we have seen a 72 per cent reduction in pushback-related delays on Mototok stands compared to the same period the year before.

It's this sort of technology that is making British Airways the most punctual, major short-haul airline in London. Our Mototoks will help us to stay at the top of the league and keep our flights departing on time. As a result of this success, we are now trialling the Mototok Spacer 195 to pushback our long-haul aircraft in the future.

We have been working alongside Heathrow Airport to introduce the Mototok into our operation, and their roll-out forms an essential part of the airport's sustainability strategy, Heathrow 2.0, and its goals to reduce emissions from our airside activities.

The future

We will continue to trial biometric technology at international airports, and the future will see customers using their unique facial features to identify themselves more frequently at check-points throughout the airport – making travelling easier while maintaining high levels of security. Along with our airport colleagues in New York, we are also investigating whether this technology can help speed up the airport immigration process.

New thinking and ideas are integral to our business. This year, in conjunction with our parent company, IAG, we're trialling driverless buses to see whether they could be beneficial to our operation.

We've also started to introduce Wi-Fi onto our long-haul flights using the provider Gogo and its next generation high-speed 2Ku satellite network. Customers can work, browse and stream from the comfort of their seat. Ninety per cent of our fleet will be Wi-Fi enabled by 2019. Of course, as an airline, you'd expect us to have new plans for our fleet too. A £4.5 billion investment over the next five years will see us take delivery of 72 new aircraft and introduce new interiors for 128 of our long-haul aircraft, which will ensure that customers have a modern and comfortable environment.

We know our customers have high expectations, especially when it comes to technology, so we will continue to seek opportunities to transform their journey through the airport. Standing still is not an option. ✈

> *Right now, we're trialling self-service biometric boarding gates on international flights out of the U.S., working in partnership with Los Angeles International Airport*

HKIA accelerates its
digital transformation

Hong Kong International Airport (HKIA) strives to provide a pleasant travel experience for its passengers from curb to gate. It's achieving this through application of a range of new technologies – from augmented reality to help passengers navigate the airport more easily, through to iBeacon location technologies to seamlessly deliver tailored messages and promotional offers for individual travellers. For *International Airport Review*, *Chris Au Young*, General Manager of Smart Airport at Airport Authority Hong Kong (AA), explores these innovations in more depth demonstrating how, behind-the-scenes, video and data analytics enable HKIA to deploy manpower and other resources more effectively and efficiently round the clock.

BIOGRAPHY

CHRIS AU YOUNG joined the Airport Authority Hong Kong (AA) in 2006 and has extensive experience in airport management, including airfield, baggage, terminal systems, airport flow and runway capacity. Prior to that, Chris was the Regional Project Manager in North East Asia at TNT Express. He also spent 10 years at Accenture, a world-leading management and IT consultancy firm, and delivered a number of business transformational projects for Fortune 500 companies. Chris is a Board Member of the Zhuhai Airport Management Company, representative of HKIA in the ACI World Airport IT Standing Committee, member of the Expert Review Panel in the Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies (LSCM), and a member of the HKIE in Logistics & Transportation Discipline. Chris holds an MBA degree and a Bachelor degree in Computer Engineering.

WITH 100 airlines connecting to 220 destinations worldwide – including 50 in mainland China – HKIA helps maintain Hong Kong's status as 'Asia's World City'. The airport boasts an advantageous geographical location – travellers can reach half of the world's population in just five hours' flying time – as well as an extensive air network. With the help of these prized features, HKIA has established itself as a leading international and regional aviation hub.

In 2016 HKIA served 70.5 million passengers and accommodated 412,000 flight movements – representing yearly rises of 2.9 per cent and 1.4 per cent, respectively – which placed the airport third in the world for international passenger traffic in 2016. Meanwhile, cargo throughput increased 3.2 per cent year-on-year to reach 4.52 million tonnes, making it the world's busiest cargo airport for the seventh consecutive year.

We continually strive to develop HKIA into a smart airport of the future by leveraging smart technologies to provide passengers with a pleasant and hassle-free journey from curb to gate. We believe this is best achieved by delivering more personalised and efficient services in this age of ▶

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1 Self-service check-in has helped to reduced passenger processing times

2 MyTAG allows passengers to receive notifications when their checked bags are approaching the baggage reclaim carousel

3 A video-analytic-based trolley management system was introduced at HKIA in 2017

fast-moving technology advancements. When passengers reach the airport, it's already the first destination in their journey: they come to the airport, not only for check-in, security screening or immigration, but also to enjoy their time there. As such, our smart travel experience aims to make travel fast, easy and joyful.

'HKG My Flight' mobile application
Today, our 'HKG My Flight' mobile app provides end-to-end airport information and services for passengers, including real-time flight status, airport maps, public transport and shopping and dining information, and more.

Approximately 10,000 iBeacons have been installed at HKIA, which enables boarding alerts and directions to be sent to passengers' mobile phones via our mobile app

Approximately 10,000 iBeacons have been installed at HKIA, which enables boarding alerts and directions to be sent to passengers' mobile phones via our mobile app. The boarding alerts put passengers at ease when shopping and dining by reminding them to set off to the boarding gate from their current location in the terminal, by the fastest route. In addition, the AR (augmented reality) wayfinding function was added to the app, which adds a real-time image of the airport to

help guide travellers. Terminal signage will also be translated into multiple languages including Chinese, English, Japanese and Korean when they view it via the app. With this capability, foreign travellers will be able to navigate HKIA in their home language, as more than 10 languages are expected be supported in the near future.

We have recently launched a smart luggage tag 'MyTAG', with which – after pairing with the 'HKG My Flight' mobile app – passengers will receive notification when their checked bags are approaching arrival at the baggage reclaim carousel. This will prevent passengers from crowding at the delivery outlets of carousels or anxiously watching for their baggage to emerge in the hope of getting it first. Instead, they can make better use of their time – such as taking a rest, calling a loved one, or using the restroom – before their baggage is ready for collection.

In addition, we have also rolled out an online reservation service for vehicle parking space in December 2017. Travellers can now reserve a parking space for three to 30 days via our website or mobile app before heading to the airport.

Streamlined airport experience

Our self-bag drop service was introduced in 2016, which reduced the processing time from two to three minutes by traditional check-in counters, to just 60 seconds. There are now 120 self-bag drop counters installed at the airport.

To further enhance the check-in service, we are introducing 120 iCUSS check-in kiosks progressively from January 2018 onwards, adding mobility and a one-stop experience for checking in at flexible locations. iCUSS is the world's first hot-swappable battery-powered mobile check-in kiosk. With both self-service and full-service modes with automatic document check, it reinvents the entire check-in experience. The versatile cloud-based mobile kiosks can be rapidly deployed and relocated for use by passengers to check themselves in, or by airport staff to provide full-service operations. They provide greater freedom and flexibility to serve passengers throughout their journey to and around the airport. We are also planning to deploy iCUSS at locations outside the airport, such as hotels, convention and exhibition centres, and theme parks, etc.

Biometric technology will be used to provide passengers with a truly seamless experience from check-in to boarding at HKIA. After validating a passengers' identity, their face will become the single token with which to pass through multiple checkpoints from security to immigration and on to boarding. Biometric-enabled auto gates will be installed to help facilitate this.

To start with, the 'Smart Departure' service was launched in October 2017, which enables passengers to self-pass through Immigration for departure via the auto gates. This shortens passenger queues, reduces immigration staff numbers, and also contributes to reducing stress levels for those passengers that experience anxiety when approaching an immigration officer. The complete end-to-end service is expected to roll-out in phases from the second half of 2018 until 2020.

Retail and catering experience

Technology is also transcending the limitations of bricks-and-mortar to write a new chapter in airport shopping and dining. In 2017 HKIA became one of the frontier airports to launch an online shop that allows passengers to pre-order packaged food and merchandise for delivery at HKIA. The HKairportshop.com platform saves passengers' time as they can browse their favourite items sold at various shops in HKIA, order and pay online three hours before they arrive at the airport, then collect the items at the airport's collection centres. HKairportshop.com offers a convenient, one-stop shopping solution for passengers, making every excursion pleasant and hassle free. Currently, the platform offers a selection of packaged food items
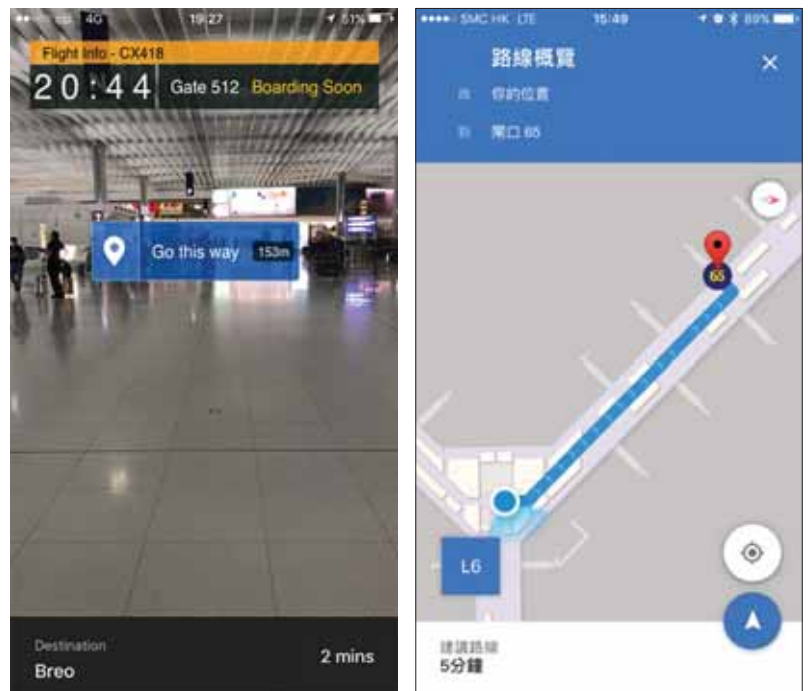
and airport exclusives, including MyTAG. A greater variety of offers will be added in the future.

Back-end operations

We are also leveraging the latest technologies in back-end operations to achieve service excellence. For example, 'Stack@EASE' baggage handling robotic arms have been installed to assist staff in working more safely and efficiently.

In addition, we introduced a video-analytic-based trolley management system in 2017, which made the timely recirculation of the 13,000 luggage trolleys at over 100 passenger pickup areas an easy task. Airports used to manually inspect trolley racks to check for availability and refill as necessary, which was not efficient. It is also difficult to track and prove the performance of the service contractors. The new video-based system enables staff to check on their mobile devices to identify where there is a potential shortage of trolleys at a certain pickup area that require replenishment. This saves the time of manual checks, enhances efficiency and provides records for performance tracking. Since introduction of the system, the shortage of luggage trolleys at the baggage reclaim hall has reduced by 93 per cent.

More to come

The effort of digital transformation is accelerating at HKIA using six key enabling technologies, namely biometrics, mobility, robotics, big data, artificial intelligence and digital twins. Multiple proof-of-concepts and other developments are also underway at our innovation centre under the umbrella of the smart airport concept. ✈

ABOVE: The augmented reality wayfinding function of the 'HKG MyFlight' app

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