

Gulf Construction

Reg No. 1 GC 027 • VOL 41 • No. 07 • July 2020 • BD3.5 | KD3 | R03.5 | QR35 | SR35 | Dh35

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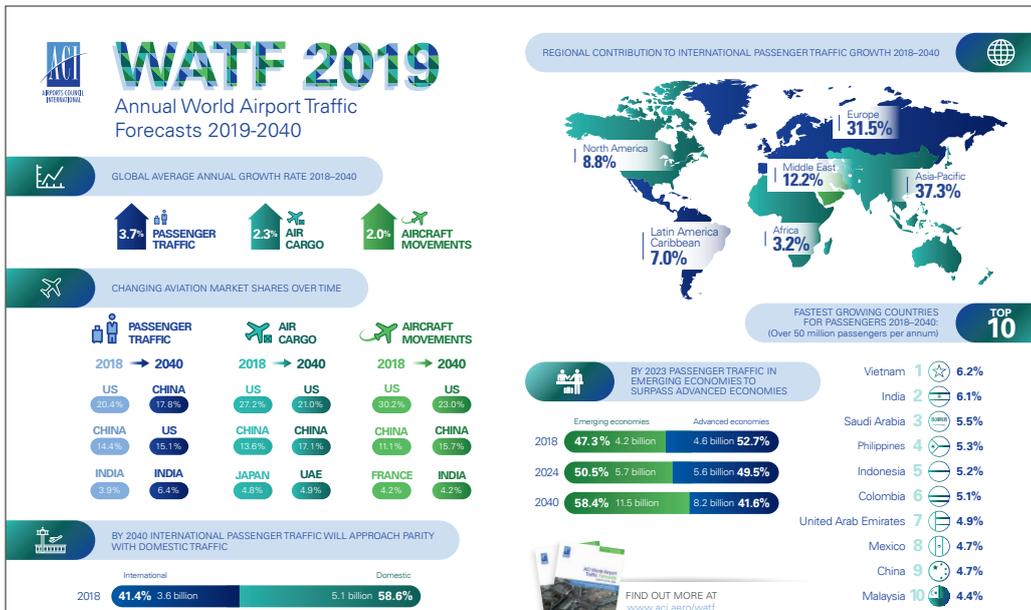
AL BAWANI



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MOMENTARY LULL

While the current Covid-19 pandemic has thrown the travel sector into the doldrums, the Middle East region is expected to push ahead – albeit with a heightened sense of safety and security – on its airport construction ambitions estimated to cost \$222.3 billion, of which \$92.8 billion worth of projects are reported to be in the execution stage.



Annual world airport traffic projections till 2040.

AIRPORT construction and development has been thriving over the past decade or so, with countries in the GCC expanding their capacity to handle the soaring number of visitors to the region as well as transit passengers who use the convenient connections that the regional airlines offer to the international traveller.

According to Global Data's Construction Intelligence Centre (CIC), airport-related construction projects in the Middle East and Africa are valued at \$222.3 billion, with \$92.8 billion worth of projects currently in the execution stage.

Saudi Arabia leads the airport construc-

tion pipeline with projects worth \$58.6 billion, followed by the UAE with \$57.9 billion.

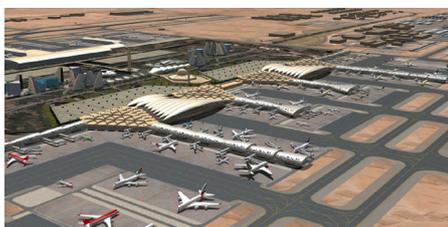
Saudi Arabia's General Authority for Civil Aviation (GACA) has been pursuing its ambitions for its aviation sector, and has recently completed work on the King Abdulaziz International Airport in Jeddah. Also planned is a 1.91-million-sq-m airport city adjacent to the airport, which is expected to become a leading destination for visitors from across Saudi Arabia and the GCC.

Among the projects being implemented in the kingdom is the expansion and upgrade of King Khaled International Air-

port in Riyadh – where two new terminals are being built; the proposed expansion of Dhahran International Airport; and the construction of new domestic airports including the first phase of King Abdullah bin Abdulaziz Airport in Jizan, and airports at Hafar Al Batin, Qunfudah, Abha, and Al Baha, among others. This apart, stunning airports are being built within each of the mega developments that are part of Saudi Arabia's Vision 2030 programme, such as the one at the \$500-billion Neom futuristic city and Amaala (see Page 54).

In the UAE, a new Mid-field Terminal Building at Abu Dhabi International Airport is receiving its finishing touches, while the existing terminal continues to be upgraded and developed in keeping with the latest demands of the market (see Page 55). Dubai and the Northern Emirates continue to expand and upgrade their airport facilities.

Meanwhile, in Kuwait, work is ongoing on the new state-of-the-art Terminal Two project following the completion of the fast-tracked Terminal Four development (see Page 53). The world-class facility, which is aiming for a LEED (Leadership in Energy and Environmental Design) Gold certification, will have a capacity to handle



Masterplan for the King Khaled International Airport expansion in Riyadh.



Artists' impressions of the domestic airports at Qunfudah and Jizan (right).

25 million passengers per annum.

In Bahrain, work is ongoing on the Airport Modernisation Programme, under which a state-of-the-art terminal is in the commissioning stage. Work is progressing on the private aviation terminal project at Bahrain International Airport, and is due for completion by February next year.

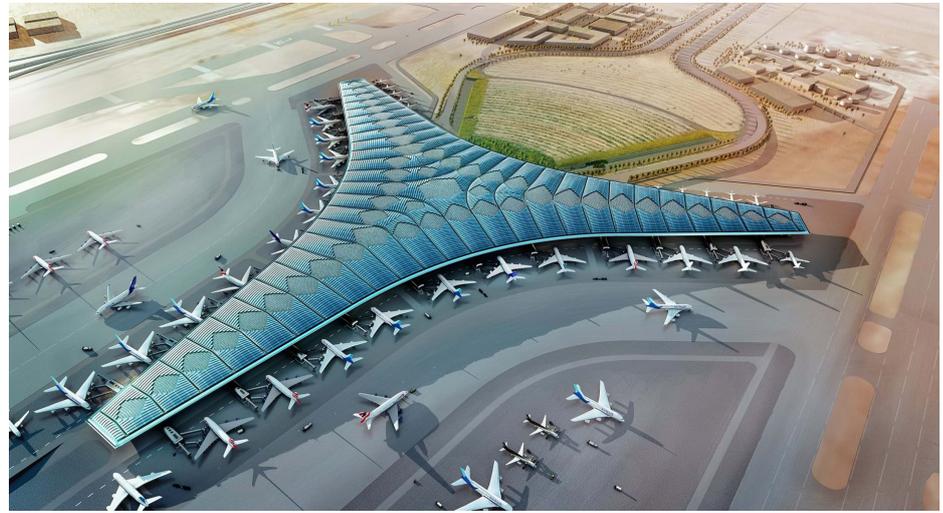
Qatar intends to push ahead with the next stage of Hamad International Airport's multiphase expansion project. Phase A will increase the airport's annual capacity to over 53 million passengers by 2022, while Phase B, which will be completed after 2022, will further boost capacity to more than 60 million passengers annually.

CORONAVIRUS PANDEMIC

The region will need to push ahead with these plans in anticipation of long-term passenger growth projections, despite the current Covid-19 crisis.

Undoubtedly, the ongoing pandemic has pushed the travel industry into the doldrums and seriously shaken the confidence of global travellers who, for some time, will book their air tickets with caution even if the airports worldwide threw open their doors to tourists.

Commenting on the impact of the health crisis to *Gulf Construction*, Samantha Solomon, Manager – Communications ACI Asia-Pacific (Airports Council International), says: "The impact of Covid-19 has put airports in survival mode. Demand in terms of passenger volumes is forecast to fall 47 per cent for airports this year. The estimated 2020 total revenue loss for airports in the Middle East region is \$7



Kuwait Airport's Terminal Two ... now under construction.

billion, representing a 52 per cent year-on-year decline. Job losses in aviation and related industries in the region could reach 1.2 million and GDP supported by aviation could fall by \$66 billion."

Over the past few months, given the high fixed costs of airports and the huge drop in revenues, airports have implemented a range of cost containment policies, both in terms of operational and capital cost, for example by closing terminals or runways where technically possible, and reducing or deferring investments. Airports right now are focused on restarting their businesses and regaining the confidence of passengers to fly again, according to the Asia-Pacific.

In the medium term, however, airports will have to re-evaluate their pace of expansion in order to meet passenger demand in the region and globally.

"Despite the hard-hitting impact of the crisis, traffic is expected to return to 2019

levels, however, in current estimates, not until 2023. ACI's pre-Covid estimates show that the Middle East will contribute 12.2 per cent by 2040 to the global passenger traffic. Saudi Arabia and the UAE are among the top 10 fastest-growing markets. Many airports in the Middle East region are pressing ahead with capital expenditures, for example Dubai International Airport. What needs to be worked through now are possible new design considerations in light of public health measures," Solomon points out.

Airports are already implementing social distancing and redefining safety measures in terms of layout and security to handle passengers in the post-Covid-19 era. Undoubtedly, airports that are in the planning stages or currently being built will now go through a thorough design re-evaluation to ensure that they meet the new challenges posed by the coronavirus disease and others. This is in addition to modernisation efforts as well as other measures to decongest and streamline passenger movement that have been ongoing.

According to Global Data, the ongoing airport construction projects across the globe have been valued at \$737.3 billion. Of this, \$212 billion is in the planning stage and Asia-Pacific accounts for the highest value with \$241.4 billion, followed by the Middle East and Africa with projects valuing about \$196.4 billion.

According to IATA, about \$1.2 to \$1.5 trillion is expected to be spent on global airport infrastructure development up to 2030. ■



The new terminal at Bahrain International Airport ... receiving the final touches.

Aecom expertise for Kuwait terminals



Kuwait Airport ... Terminal Two construction works well in progress.

AECOM is currently working on the Terminal Two (T2) project at Kuwait International Airport with contractor, Limak, ensuring the effective erection of one of the biggest airports under construction in the world.

The initial design was carried out by Foster and Partners, and Aecom has been responsible for developing the architectural design, the multi-disciplinary design coordination and building information modelling (BIM) management services of the 750,000-sq-m terminal building.

"This has been and is still an exciting project, whose size and complexity requires the alignment and coordination of multidisciplinary teams all around the globe (10 different companies from seven countries) and the management of an amazing amount of information," says Víctor Pérez Raposo, Director of Architecture, Spain, at Aecom, tells *Gulf Construction*.

As this is one of the most complex and demanding BIM projects in the world, Aecom has worked hard to produce the BIM standards and strategy, while specific QAQC BIM tools have been developed under Dynamo, Python and Revit API, he says.

"The use of BIM is a key factor for the success of this project and its implementation," he adds. "Using in-house developed plug-ins, scripts, BIM specific tools and new cloud collaborative software as well as producing tailored BIM standards and strategy have not only exceeded client expectations but anticipated potential issues. It has also offered solutions to the client, optimising and saving costs during the construction process."

The new development at Kuwait International Airport comprises a mixed-use airport terminal building. The terminal has a trefoil plan, comprising three symmetrical wings that extend from a central space and include 32 arrival/departure gates. Each façade spans 1.2 km and all extend from a dramatic 25-m-high central space. The building includes two levels of basement, extending 12 m below access level, a ground floor and three upper levels extending 18 m above ground level.

TERMINAL 4

Meanwhile, Terminal Four (T4), which is currently operational, was developed from 2016 to 2018. It was a joint effort by the Directorate General of Civil Aviation

(DGCA) from Kuwait, Cengiz (Turkish contractor) and Aecom.

The fast-track project meant that while designing was being carried out and decisions taken, the contractor was on site executing the work, as the current terminal building was overloaded and the new build was needed urgently to maintain the capacity until Terminal 2 becomes operational. With a compressed schedule of only 15 months to be totally operational, the client and contractor's teams worked closely with the designers in allocating tasks to develop the design efficiently and ensure that design packages were delivered seamlessly.

The collaboration between Aecom and Cengiz enabled successful implementation of the initial plan. Designing and



The terminal's wings extend from a dramatic 25-m-high central space.

building the terminal in record time was paramount. The project not only included the terminal building of 56,000 sq m with a capacity to handle 4.5 million passengers, but also a car park, a skywalk bridge connecting the building ending in satellite, and some additional ancillary buildings. "The excellent dynamics created between design team, contractor and the client is shown in the quality of the thinking and of course, the final product," says Raposo.

The terminal was designed with a clear and direct passenger circulation system, minimising turns, decision points and travel distances, always avoiding crossflows and conflicting passenger movements.

"The construction is a real example of how a public structure can encompass elements from the local culture through processes of intuitive customisation work and is reflected not only in the building but also in the surrounding landscape," he adds. ■

Mirage will turn to reality at Amaala



Foster + Partners' futuristic concept for Amaala's airport.

UK-BASED Foster + Partners' futuristic concept that draws inspiration from the dramatic desert environment has been selected as the winning design for a new airport that is expected to be built by 2023 at Amaala, an ultra-luxury destination taking shape along Saudi Arabia's northwestern coast.

The airport, which will have a capacity to accommodate one million travellers per year when it officially opens, will serve the 4,155-sq-km year-round destination, which is set in the Prince Mohammad bin Salman Natural Reserve across three unique communities. Amaala will include 2,500 hotel keys and more than 800 residential villas, apartments and estate homes, alongside 200 high-end retail establishments, fine dining, wellness and recreational facilities.

The airport terminal and control tower design conceptualised by the UK-based architectural and design firm is inspired by the optical illusion of a desert mirage. The masterplan of the airport was designed by Egis, an international consultancy and engineering group.

Commenting on the new airport, Amaala CEO Nicholas Naples says: "A gateway to Amaala, visitors will be greeted by personalised experiences from the moment they step off the plane. From design to personalisation, this will be no ordinary airport. Immersed in the spirit of Amaala, the airport will create an environment that embodies

the philosophy of the destination beyond."

"This will be a unique space that personifies luxury and marks the start of memorable experiences for the world's most discerning guests. We are delighted to work with Foster + Partners and Egis on this project," he adds.

On approaching the airport, travellers will see stunning land art from the air. Entering the terminal, visitors will be greeted with a sleek mirrored edifice rising from the desert. The structure takes its inspiration from the surrounding environment, resulting in a mesmerising mirage effect. A spacious courtyard will anchor the terminal and will be complemented by contemporary interiors complete with unique artwork and tailored experiences.

According to Naples, the airport will reflect Amaala's ultra-luxury hospitality

spirit, providing an exclusive private-club experience perfectly encapsulating its pillars of art and culture; wellness and sport; and sea, sun, and lifestyle.

Among the list of amenities provided by the airport are climate-controlled hangars that will be available for private jets as well as a ground transfer service that is accessible from inside the arrival hangar.

On the 'mirage' design, Senior Executive Partner Gerard Evenden says: "Focusing on the themes of art, wellbeing and sport, the Foster + Partners design seeks to establish a new model for private terminals that provides a seamless experience from resort to aeroplane.

"Responding to the surrounding landscape, the terminal building will form an exclusive gateway to the Amaala resort. The passenger experience through the entire building will be akin to a private members club – luxurious and relaxing."

Egis Aviation Director (Middle East & South Asia) Jacques Khoriaty, says: "Along with embodying the luxurious spirit of the resort, the Amaala airport meets the highest environmental design and sustainability standards, is operationally versatile and incorporates the latest airport technology and best practice standards on offer."

"It has been a privilege to have worked closely with Amaala to define the requirements of this unique project and we look forward to continuing our support all the way through to the opening of the airport in 2023," he concludes. ■



Amaala's airport ... inspired by the optical illusion of a desert mirage.

Abu Dhabi airport gets touchless elevators

IN a world first, Abu Dhabi Airports has partnered with Meta Touch to deploy new touchless technology across 53 elevators at Abu Dhabi International Airport (AUH), helping to prevent cross-infection from interacting with elevator buttons and enable a Covid-19-free airport environment.

The new technology, Tchk (Touch-less Keypad Technology), was designed and manufactured by Meta Touch, a start-up based at the UAE University Science and Innovation Park (UAEU SIP), which develops innovative solutions designed to support health and safety.

Tchk is a touchless control panel that allows users to command an elevator without physically pressing any buttons, by simply waving their hands in front of the panel to indicate the desired floor or direction.

Abu Dhabi Airports' investment in this state-of-the-art technology is the result of the airport group's commitment to containing the spread of Covid-19 and ensuring that its airports and facilities remain safe and healthy environments for passengers, staff and visitors. The airport group is continually refining its health and safety procedures to enable a safe, smooth and seamless travel experience for all passengers, in line with the directives of Sheikh Mohammed bin Hamad bin Tahnoon Al Nahyan, Chairman of Abu Dhabi Airports.

Shareef Hashim Al Hashmi, Chief Executive Officer of Abu Dhabi Airports, says: "The installation of the new technology across our elevators at Abu Dhabi International Airport is a significant development in ensuring the safety of all our guests and travellers. This innovative technology bolsters the extensive safety measures our company has implemented as a regional leader in the airports sector."

"We are constantly introducing new solutions at Abu Dhabi International Airport to contain the spread of Covid-19 and deliver a safe, smooth and seamless travel experience for all our customers. We are particularly proud of installing Tchk, as it will reduce the risk of cross-infection by



A touchless control panel at an elevator at Abu Dhabi airport.

eliminating the need to physically touch any elevator buttons," Al Hashmi adds.

Dr Fady Al Najjar, Associate Professor at the United Arab Emirates University (UAEU) and Chief Executive Officer of Meta Touch, says: "We were keen to quickly design, test, and manufacture technology that can protect public health and fight the spread of Covid-19. These new devices are designed to be easy to install on any elevator, enabling companies to quickly introduce this additional protection against the virus. We are proud to introduce Tchk for the first time across the globe at Abu Dhabi International Airport, and will continue to support the nation in overcoming this outbreak."

This new technology follows the recent introduction of the CoDi BOT UGV (unmanned ground vehicle), robots designed to support with the sterilisation of staff areas, cargo facilities, and passenger aircraft cabins, as well as SterixGates sterilisation booths designed to safely disinfect a person within as little as three seconds.

Abu Dhabi Airports partnered with Tawazun Strategic Development Fund (TSDF) to launch the new CoDi BOT UGVs, designed and manufactured by UAE-based company Marakeb Technologies, an affiliate company of TSDF, for the disinfection of viruses including Covid-19.

Specifically ensuring aircraft cabins are kept clean and sterile, the CoDi BOT UGV is designed to be able to manoeuvre through airplane cabin, which is a unique

feature of this product, while ensuring the safety of its operators through remote control capability, using real-time video and high-speed 4G data connection.

The introduction of the robot helps operational teams carry out safer missions during the sterilisation of aircraft while parked at Abu Dhabi International Airport, eliminating the risk of human exposure and self-contamination. The robot's versatility also enables the disinfection of spaces within the airport terminals..

Other new technologies developed to contain Covid-19 at Abu Dhabi International Airport include thermal scanning cameras that incorporate the latest artificial intelligence (AI) technology, as well as cameras with facial recognition capabilities and heat motion sensors to track the movements of people, including those potentially infected with Covid-19.

The new measures are being implemented alongside the existing extensive range of preventative measures in place at Abu Dhabi International Airport.

Abu Dhabi Airports is part of ADQ, one of the region's largest holding companies with a diverse portfolio of major enterprises spanning key sectors of Abu Dhabi's non-oil economy. It was established in March 2006 to spearhead the development of the emirate's aviation infrastructure. In September 2006, Abu Dhabi Airports assumed responsibility for the operation and management of Abu Dhabi and Al Ain International Airports. In 2008, Abu Dhabi Airports added Al Bateen Executive Airport (an exclusive business aviation airport), as well as Sir Bani Yas and Delma Island Airports to its portfolio. These airports are geared to serve the various segments of air travellers, the aviation marketplace, and will help contribute to Abu Dhabi's development as a destination for both business and leisure tourism.

Currently under way is the multi-billion-dollar redevelopment and expansion of Abu Dhabi International Airport designed to increase its overall capacity. This includes the Midfield Terminal project, which is in the final stages of completion. ■