

#### INTRODUCTION

3

What is ORAT?

Using ORAT to mitigate potential risks of airport openings and operations.

#### **SOLUTIONS**

5

Read how we integrate ORAT through project, design, development, and delivery.

#### **SERVICES**

7

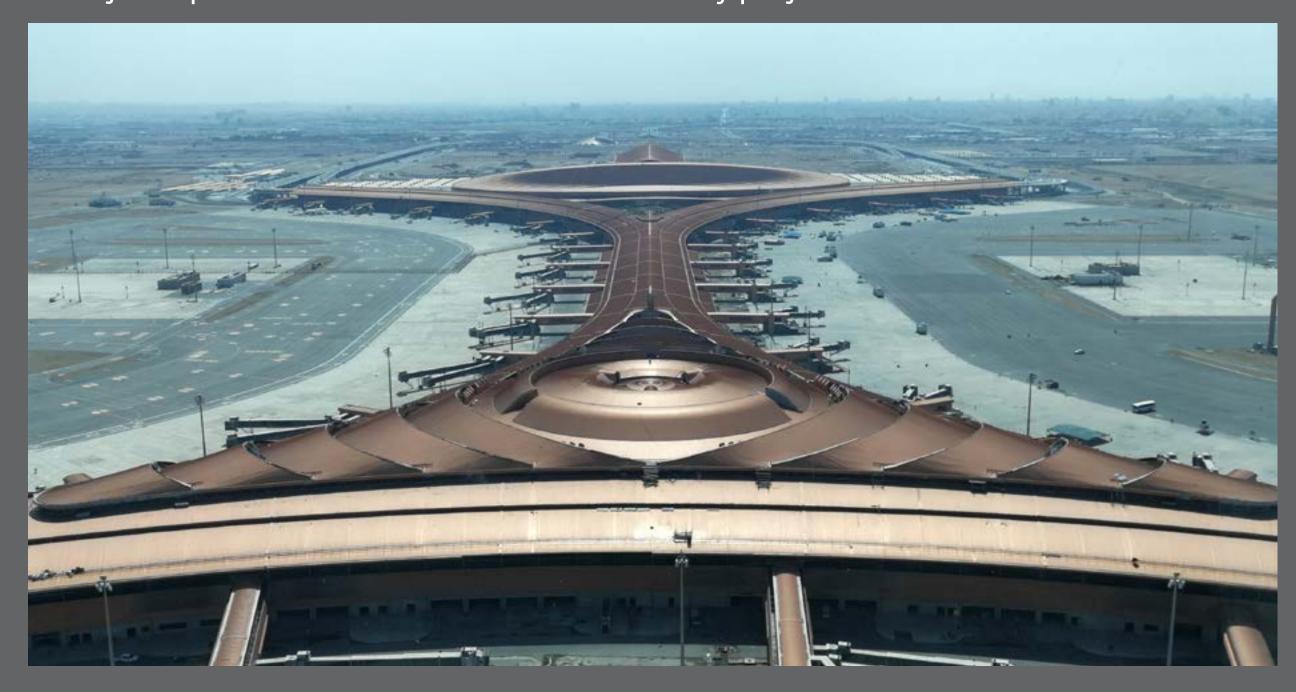
Find out about the ORAT services we deliver at each stage of the project lifecycle.



#### **GLOBAL EXPERTISE**

15

From the US to the Middle East, we have delivered ORAT projects at major airports. Find out about some of our key projects.



### OPERATIONAL READINESS EXCELLENCE (OREx)

14

We have developed our own innovative information management tool to support ORAT. Discover more.

#### **CONTACT US**

23

Get in touch with the team.



Next page ►

2

INTRODUCTION

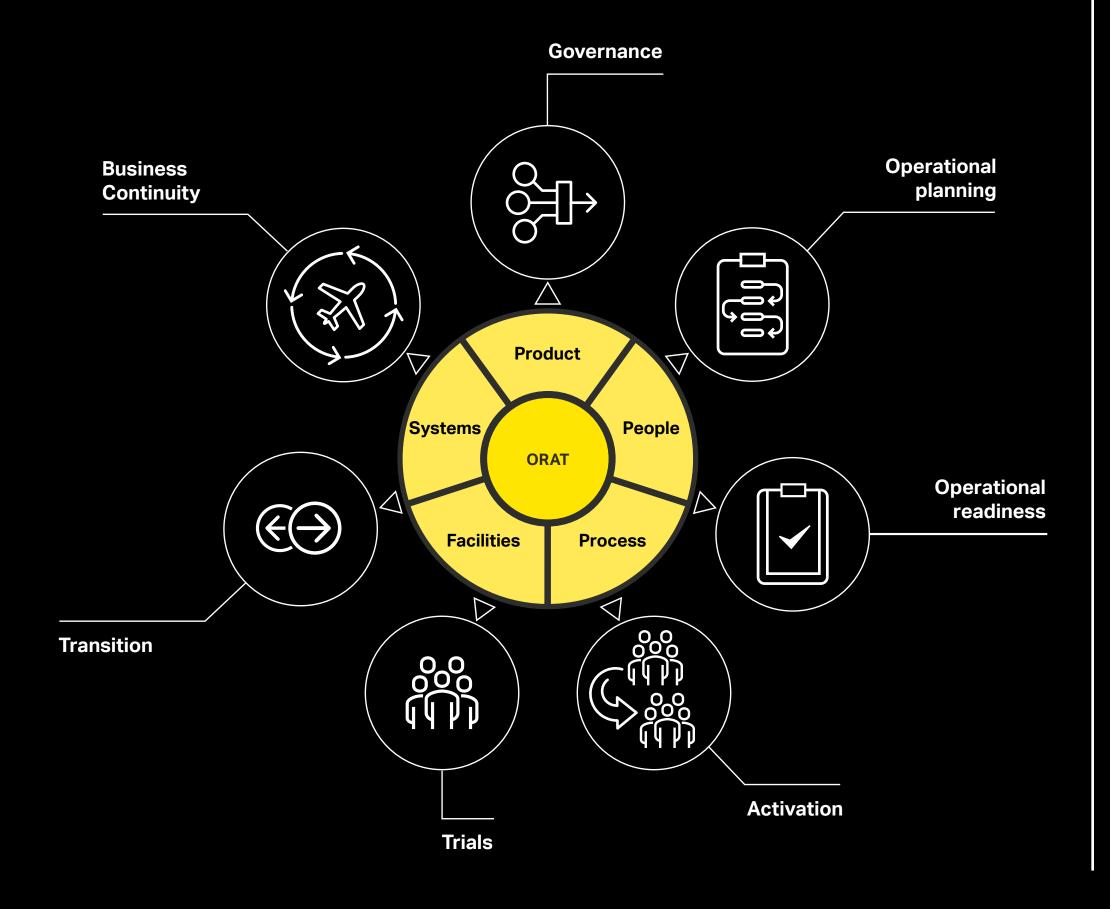
# SEAMLESS TRANSITION FROM PROJECT DELIVERY TO OPERATIONS

#### WHAT IS ORAT?

Operational Readiness, Activation and Transition (ORAT) is the integrated approach to managing the transition of a new airport service or facility from project delivery into active operations.

ORAT is a recognised and proven risk mitigation technique that increases opportunities for a seamless transition of new airport projects, services, and facilities from construction to active operations.

An ORAT approach combines the operational goals of airport owners, operators, and aviation partners into a single program — integrating project delivery and operational readiness activities into one plan to ensure that an organisation maximizes the potential and return on their investment from day one.



3

### 66

ORAT is a project and programme delivery methodology which provides a standard and structured approach for managing multi-stakeholder, cross-functional projects and programs.

### USING ORAT TO REDUCE THE RISKS OF AIRPORT OPENINGS AND OPERATIONS

Undertaking the development of a new airport or a major airport expansion will create numerous challenges for the airport owner, operator and its aviation partners.

All stakeholders need to collaborate to visualise and plan for how the airport's operations will change, so that they are aligned to the new working environment and are prepared to perform from day one.

Major airport projects are further compounded with the risks involved in the transition from construction to operations which must be meticulously managed. If these risks are not effectively managed the airport owner can face the negative impacts of a failed or problematic opening, which can potentially lead to loss of business and damage to the airport's reputation.

Problems associated with airport openings can be directly linked to a lack of formal ORAT processes. AECOM's ORAT approach integrates the owner, operator, construction delivery, and operational stakeholder plans; providing a holistic and structured approach for dealing with the challenges of managing the many risks involved.



Drawing on our experience from airport projects around the world, AECOM's **ORAT** approach reduces overall time to market and ensures a predictable and sustainable outcome, with effective and efficient operations. We encourage, and help implement, early adoption of ORAT services within the planning phase of projects so that operational objectives are defined as early as possible — keeping projects on track for successful openings.

### **OUR ORAT APPROACH**

Our ORAT approach focuses on creating both the environment for success through connected leadership and governance, and the structure for success by adopting a proven ORAT framework and approach.

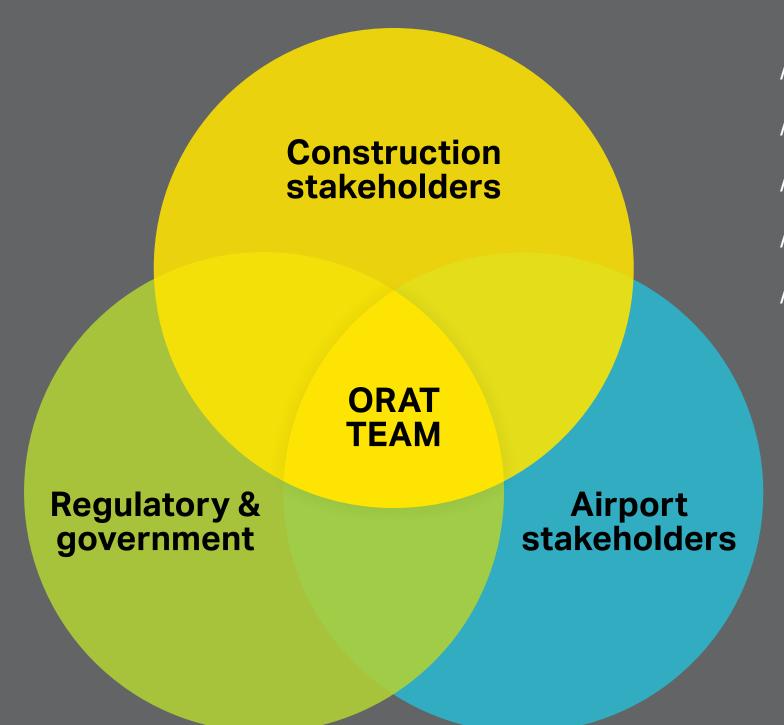
We coordinate cross-functional teams of internal and external stakeholders, managing project delivery through operational and functional single point-of-contact resources.

Connecting different stakeholder groups, our ORAT teams continually plan, act, check and revise stakeholder readiness activities along the project schedule. This helps achieve safe, secure, smooth and sustainable airport operations from the opening date.

By harnessing the project knowledge we've gained from working on airports across the world, we eliminate common ORAT implementation issues and bridge the gap from construction completion to a functional airport. Our experienced ORAT leaders help airports deliver successful openings by facilitating executive buyin, ensuring enough resources are accounted for, enhancing communication, and delivering effective planning and stakeholder engagement services.

We have a track record of delivering successful ORAT projects which have provided a safe, sustainable, and smooth transition from project completion through to facility operations. Our approach combines strategies, people, processes, facilities, systems, products, and services into one single plan.

To mitigate common ORAT issues, we have developed OREx — an advanced information management tool which leverages technology to support operational readiness. The OREx platform helps us manage large, complex projects, allowing users to track critical issues and overall progress throughout a project (see page 14).



- / Integrated approach
- / Connected leadership
- / Preparing people
- / Operations & activation
- / Transition

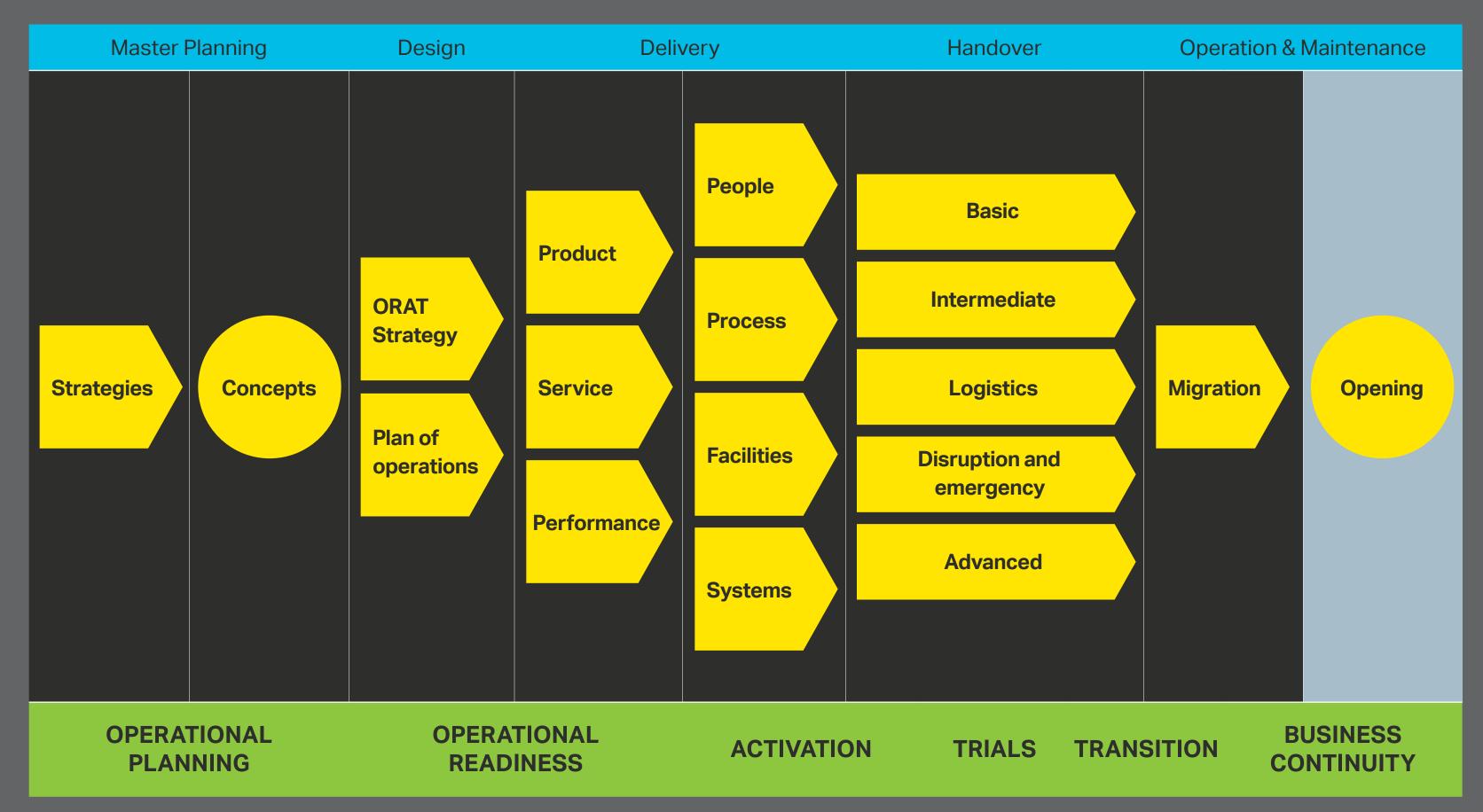
6

### INTEGRATING ORAT THROUGH PROJECT DESIGN, DEVELOPMENT, AND DELIVERY

For us, ORAT starts at the very beginning of a project, as early engagement of ORAT services helps overcome the challenges of delivering successful airport openings. We help integrate ORAT throughout the entire lifecycle of an airport project — through design, development and delivery stages, and advocate early engagement to ensure operational objectives are considered and defined at the master planning phase.

Our approach overlaps ORAT processes with the typical project delivery cycle from planning through to completion. This helps identify scope gaps early, align business and project priorities, improve communication among stakeholders, and prepare the airport operator for acceptance and operation of a new facility.

While early engagement of ORAT services at the planning stage is our ideal approach to ensuring successful airport openings, we also have the capability and experience of delivering ORAT services at later stages of a project's lifecycle, helping keep an airport opening on track even when ORAT wasn't initially considered at the outset.



ORAT SERVICES 

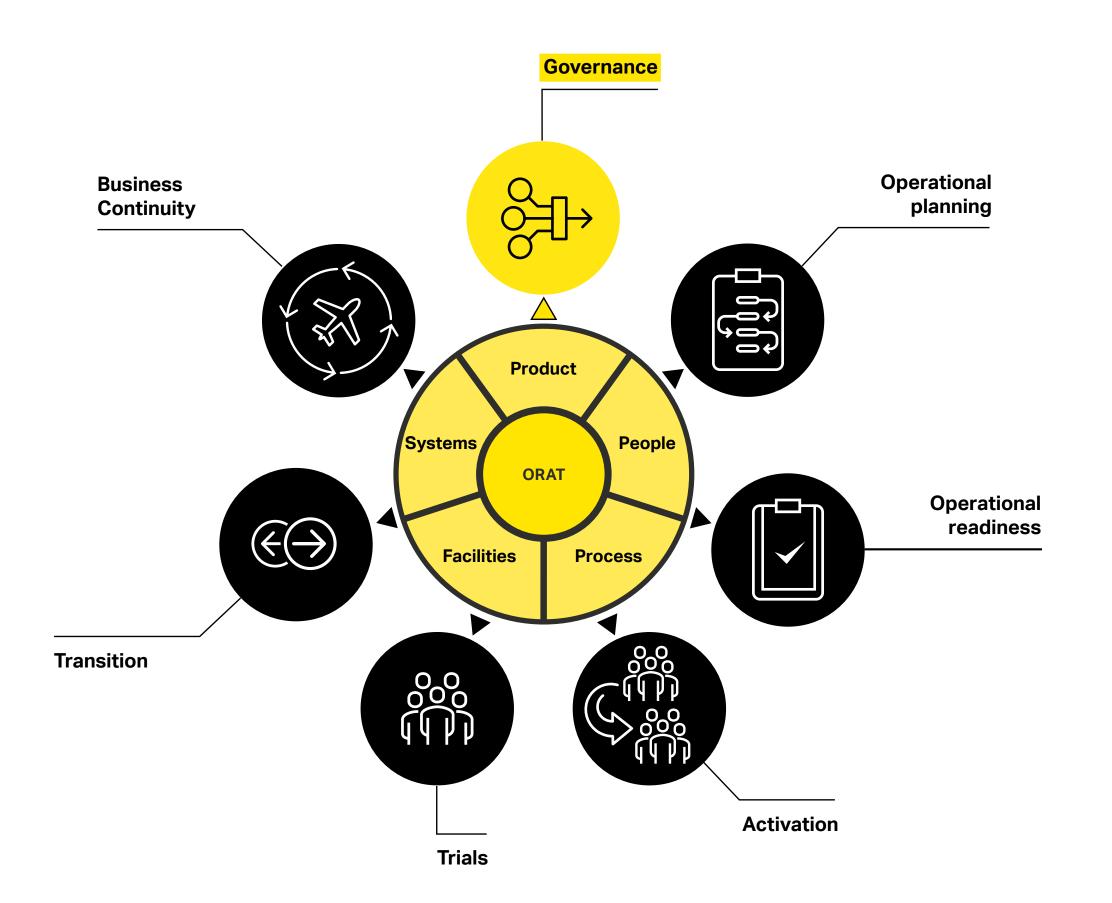
◀ CONTENTS

### **OUR ORAT SERVICES**

#### **GOVERNANCE**

### Connected leadership focused on a joint objective

We work with clients to establish a robust and formal ORAT governance structure to manage projects. This helps align project and business priorities to facilitate risk management, issue resolution, and decision making. The framework we use focuses on executive-level governance, as well as management levels and single points of contacts (SPOCs) across stakeholder groups. Our focus cascades down to core work streams and cross functional focus groups to maintain regular and effective communication. Good governance fosters understanding, encourages executive 'buy in', minimizes uncertainty and guides senior management and operational stakeholders towards a combined end-goal.



ORAT SERVICES 

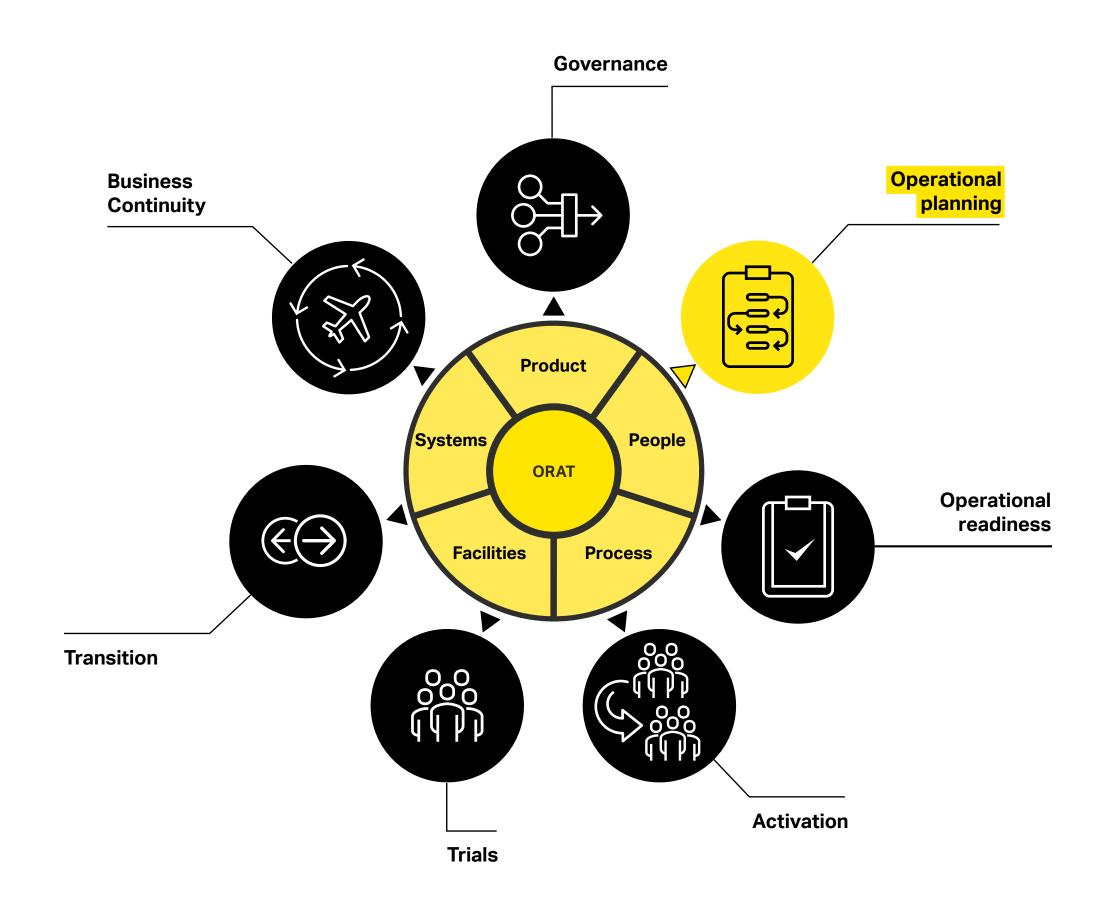
◀ CONTENTS

### **OUR ORAT SERVICES**

#### **OPERATIONAL PLANNING**

### Strategies, master planning and operational concepts

Early adoption of the ORAT approach begins from inception and master planning. Our ORAT team define operational strategies and concepts to influence and align master planning, design, and development stages of projects. We then develop this into a comprehensive Plan of Operations covering every aspect of our client's Target Operating Model, including product and service performance aspirations. The Plan of Operations forms the plans for business and operational changes required during the operational readiness phase of projects including budgeting, associated resource requirements, and stakeholder implications.



ORAT SERVICES 

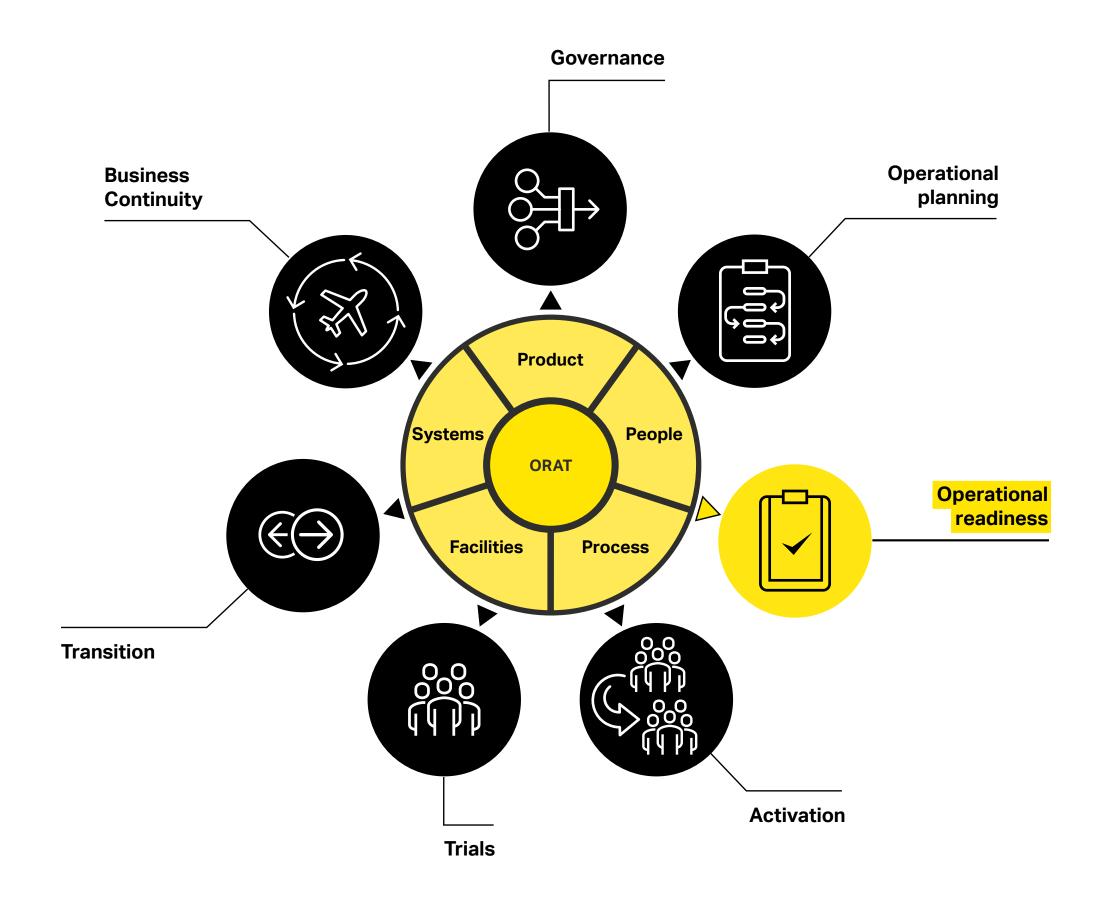
◀ CONTENTS

### **OUR ORAT SERVICES**

#### **OPERATIONAL READINESS**

#### Preparing for day one, people, and processes

Operational readiness focuses on the execution of the Operational Readiness Plan in close collaboration with stakeholders. Our ORAT team work with clients to manage stakeholders to execute operational plans in close coordination with the overall project. This ensures stakeholder readiness to operate, enabling the operational trials and ultimately the airport opening. We have a keen focus on both strategic and tactical change management covering changes to the airports operating model, management of operations and standard operating procedures, as well as ensuring people readiness through training and familiarisation.

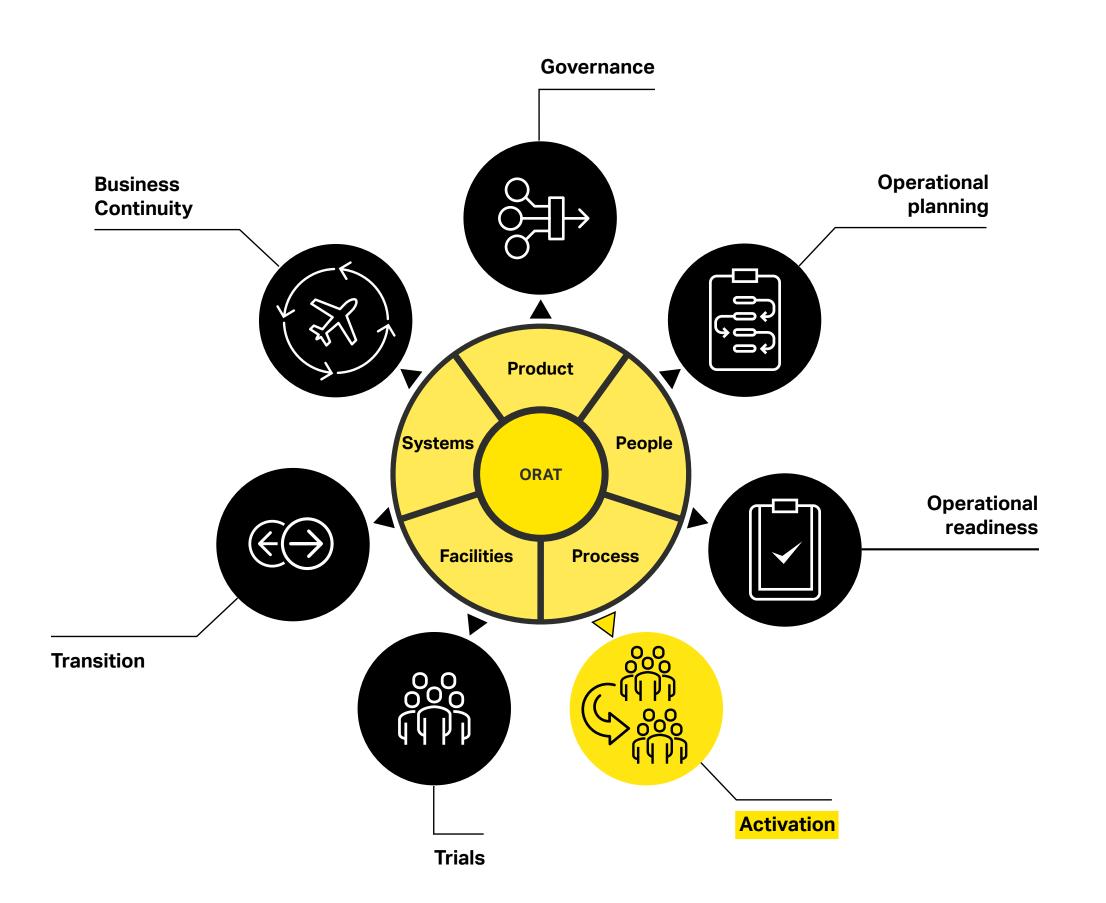


### **OUR ORAT SERVICES**

#### **ACTIVATION**

### Handover and acceptance, transition of operational responsibility

We prepare the owner and operator for the acceptance and operation of the new facilities and systems and focus on the transition of responsibility and ownership from construction to operations. Our ORAT team work with aviation clients to ensure a clear handover process and that facilities and systems are configured for day one operations. We ensure that support and maintenance responsibilities are clearly defined, and in place, for active operations.

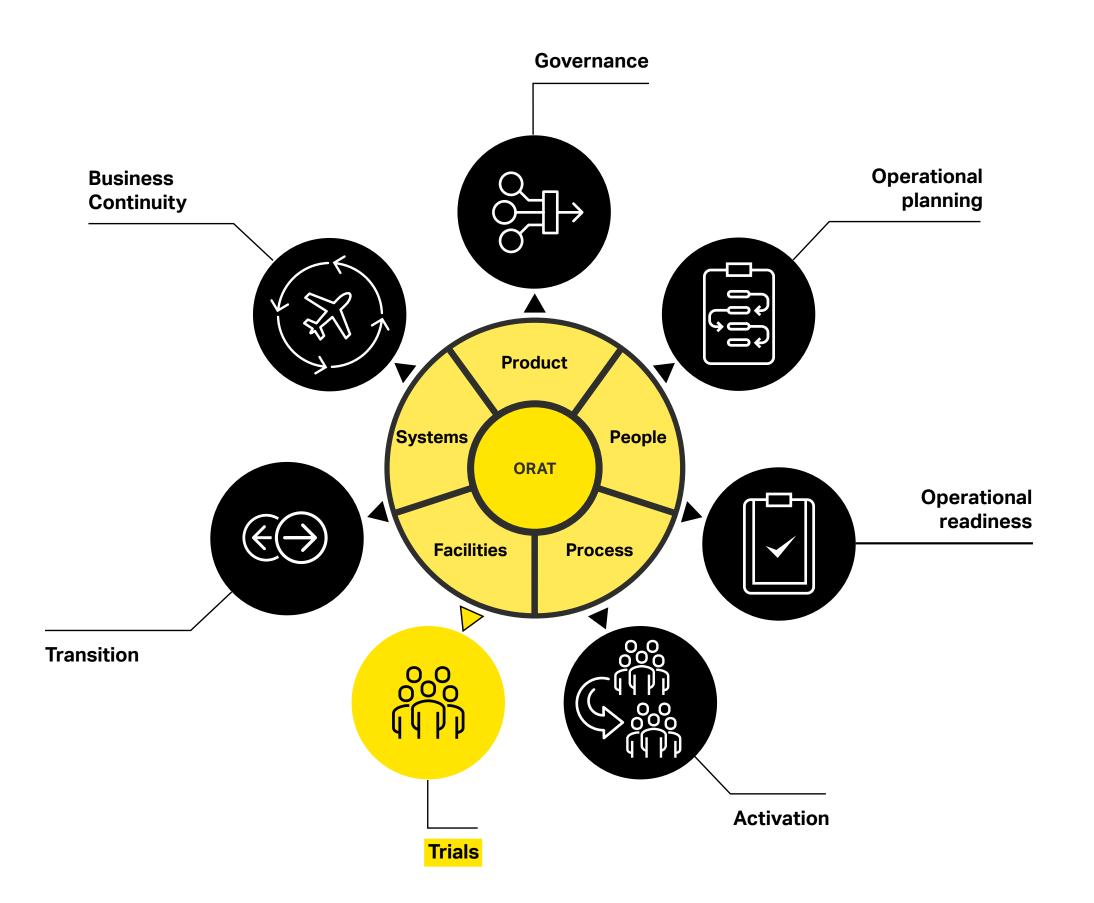


### **OUR ORAT SERVICES**

### **TRIALS**

### First of type, basic, intermediate, disruption and emergency, and advanced trials

Operational trials demonstrate that a new or modified facility is ready for operations. Trials are intended to emulate actual operating conditions that show the full integration of systems and facilities with operational procedures and staff. Trials are progressive both in scale and complexity, ensuring that every aspect of new operations is thoroughly proven before opening. Carrying out trials helps engage stakeholders and build momentum and confidence towards live operations.

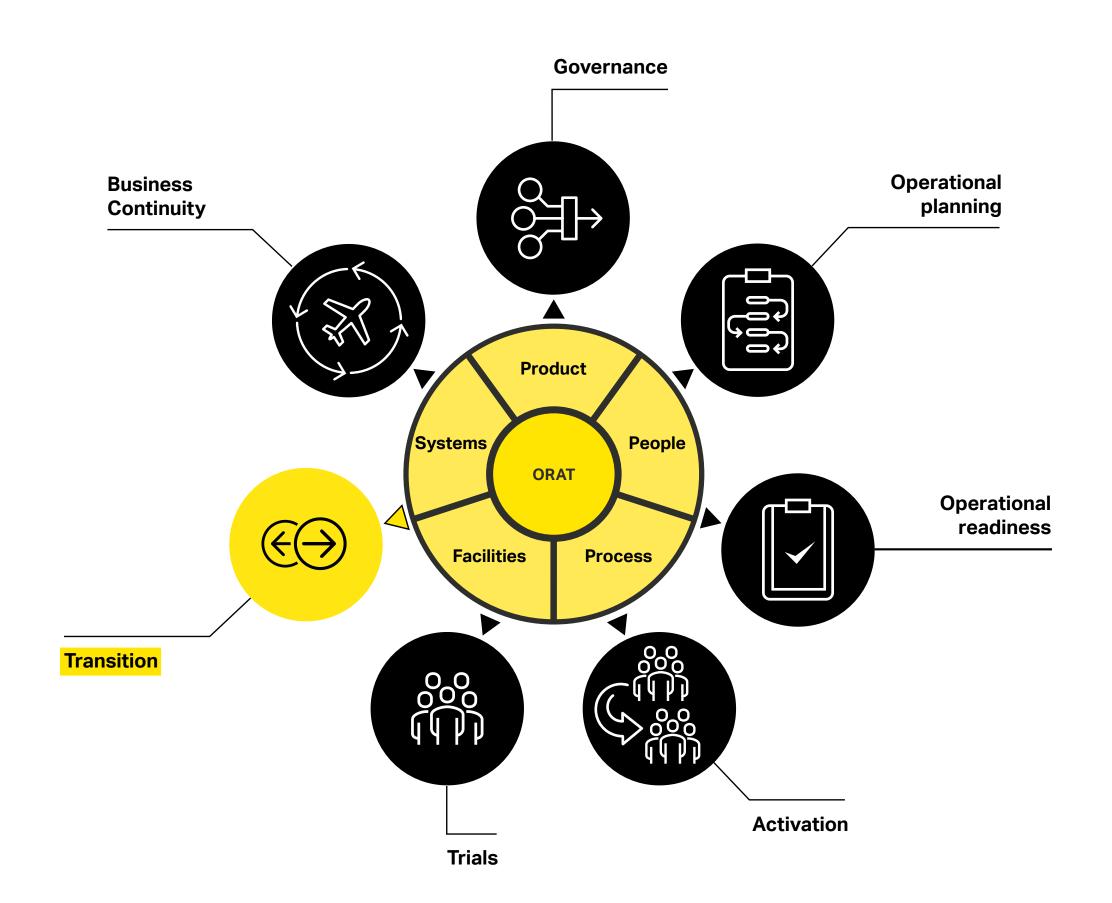


### **OUR ORAT SERVICES**

### **TRANSITION**

### Opening strategy and transition logistics

An opening strategy and transition plan define the most appropriate route for the airport to commence active operations. This must be carefully planned and co-ordinated with the owner, operators, maintainers, and stakeholders to minimise the potential for interruptions to operations, reductions to airport capacity, and to ensure a smooth and trouble-free transition.

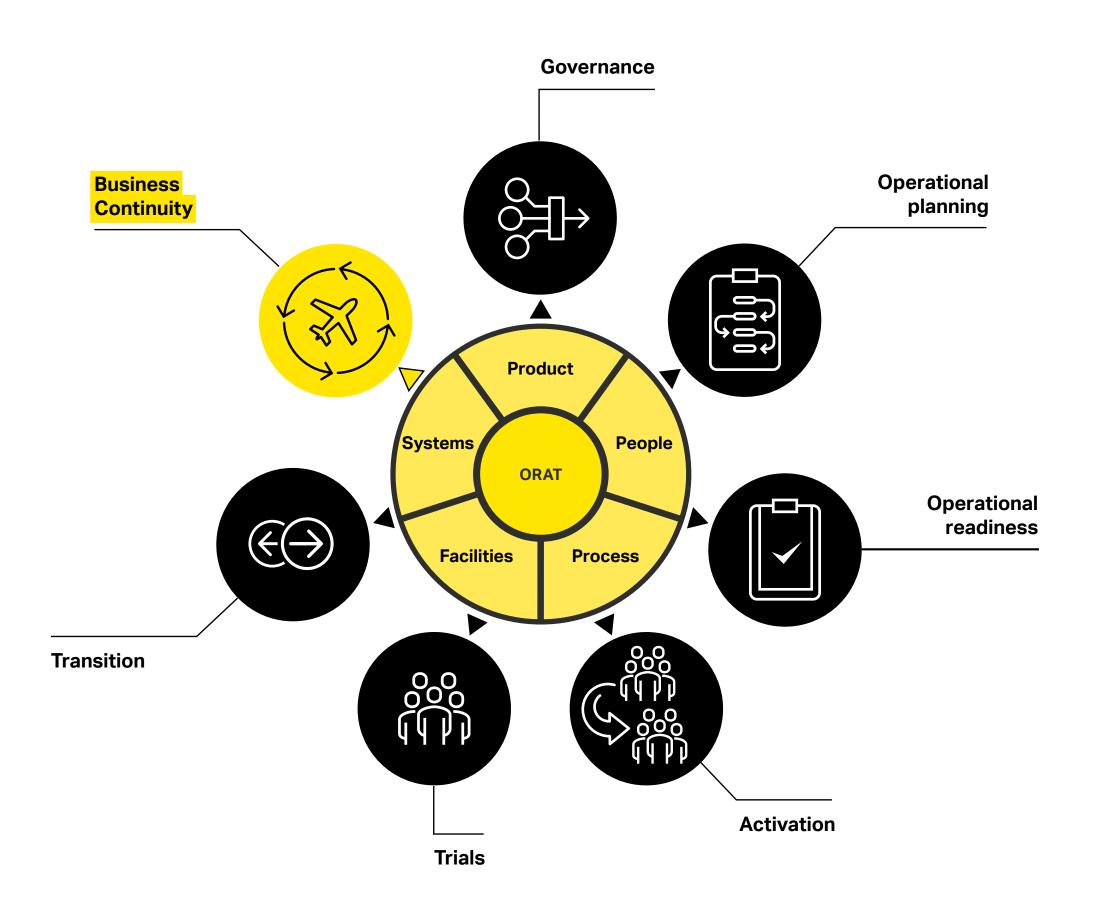


### **OUR ORAT SERVICES**

#### **BUSINESS CONTINUITY**

### Operational support through transition and early phases of operations

The early days of operations carry the most risk to operational and business continuity. Our aviation experts ensure that our clients and their stakeholders have the support needed to manage the transitional period, as well as the early days of airport operations. We support operations and help build confidence and efficiencies during early operations.



# LEVERAGING TECHNOLOGY TO SUPPORT OPERATIONAL READINESS

### OPERATIONAL READINESS EXCELLENCE (OREx)

OREx is our advanced information management platform for ORAT. Through collaboration with AECOM's Global Aviation team, we developed an effective management tool for ORAT by leveraging decades of aviation experience.

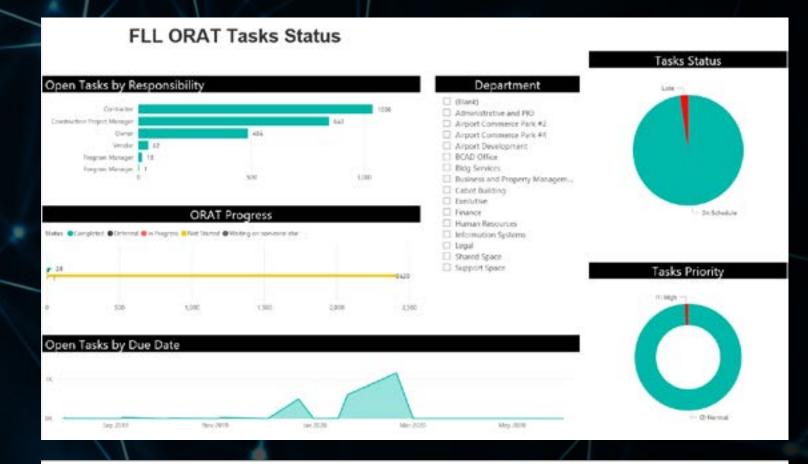
It uses a comprehensive approach that focuses on delivering assets from construction as well as the activities needed for an operational facility. OREx is easily tailored to a client's specific project needs.

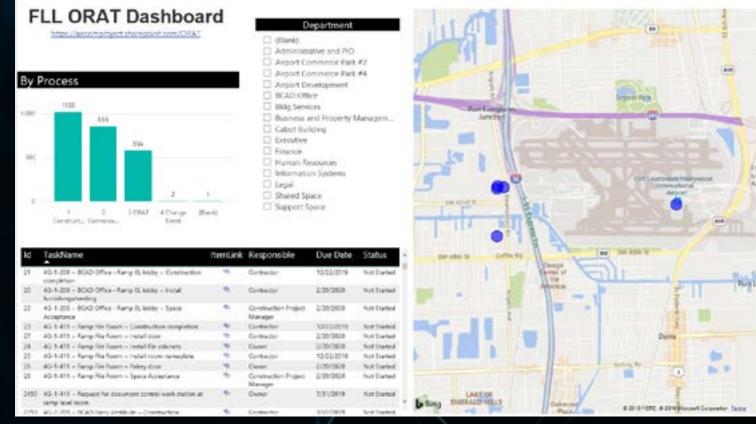
Using OREx creates multiple advantages. The platform helps efficiently utilize work breakdown structures to manage large and complex projects, and increase team accountability. It can track critical issues and overall progress as well as tracking actual versus scheduled performance. OREx helps identify change events and integrate them into projects.

Our team of professionals help mitigate common ORAT issues and highlight the solution to a successful ORAT program. Using OREx, we can deliver a vast range of benefits including:

- / Secure, enterprise-grade infrastructure
- / Management of large, complex projects
- / Provide real-time monitoring and reporting on all systems and processes required under ORAT
- / Early identification of critical issues, missing scope, or actions
- / Provide real-time management and distribution of required actions
- / Facilitates critical decision-making on a timely basis

- / Improve stakeholder coordination and communication
- / Schedule ORAT activities
- / Track and resolve new facility issues in an operational environment
- / Increased stakeholder engagement and ownership of process
- / Reduced time from construction completion to an operational facility





Our OREx platform helps manage large and complex ORAT projects

# DELIVERING SUCCESSFUL AIRPORT OPENINGS ACROSS THE WORLD

Our experience is drawn from airport projects from around the world. We've assembled a team of experts in the field of ORAT that are flexible to meeting the need for ORAT services globally.



### SAN DIEGO INTERNATIONAL AIRPORT SAN DIEGO, US

We've provided program and construction management services for San Diego Airport since 2006 and successfully completed several major projects. As a stakeholder on the Activation Team, we provide ORAT services for the aviation department.

### The Activation Team helped deliver the following project at SAN

**Green Build** 

Rental car centre

Parking plaza

Flight information service project

\$820 million LEED (Leadership in Energy and Environmental Design) rating platinum terminal expansion

\$316 million, 2.1 million square foot facility

\$127 million 2,900 parking space garage

\$229 million project to convert six existing gates to international swing gates and provide 1,000 PAX per hour processing capacity

16



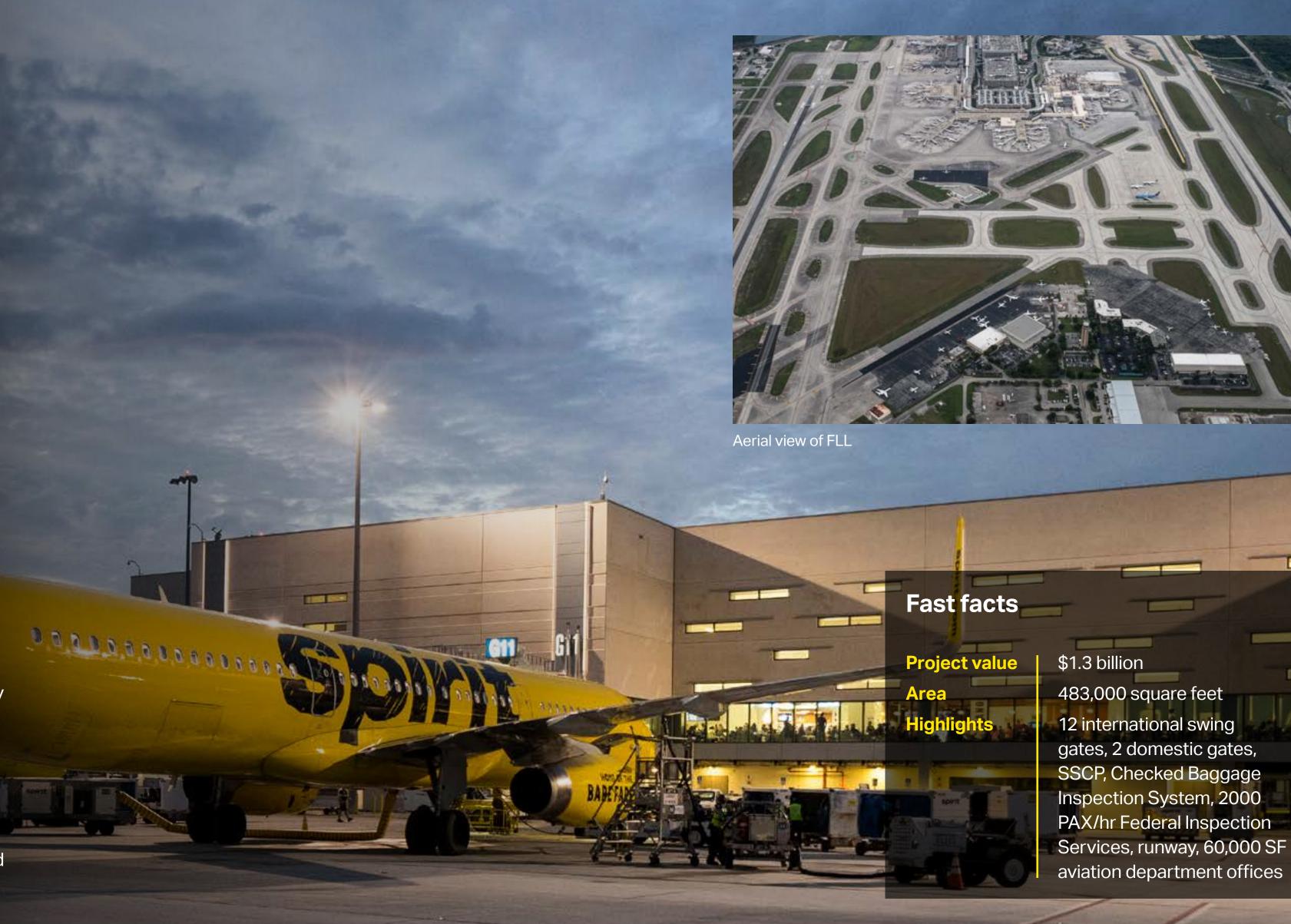
## FORT LAUDERDALE-HOLLYWOOD INTERNATIONAL AIRPORT FLORIDA, US

### New south runway and Terminal 4 replacement

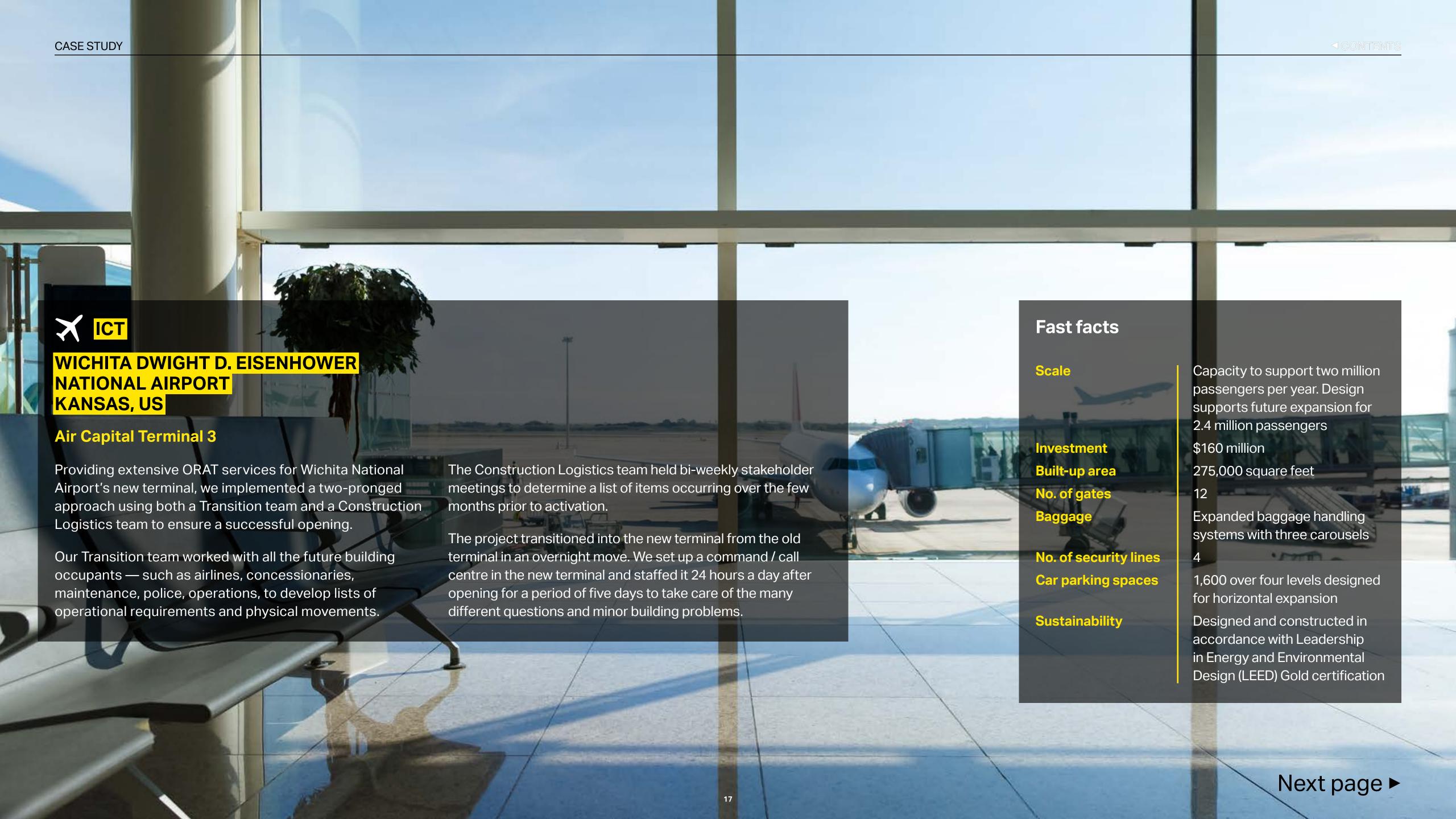
As program manager of the FLL Terminal 4 replacement project, we developed the commissioning guideline and performed as a stakeholder in the ORAT process as an extension of the client staff.

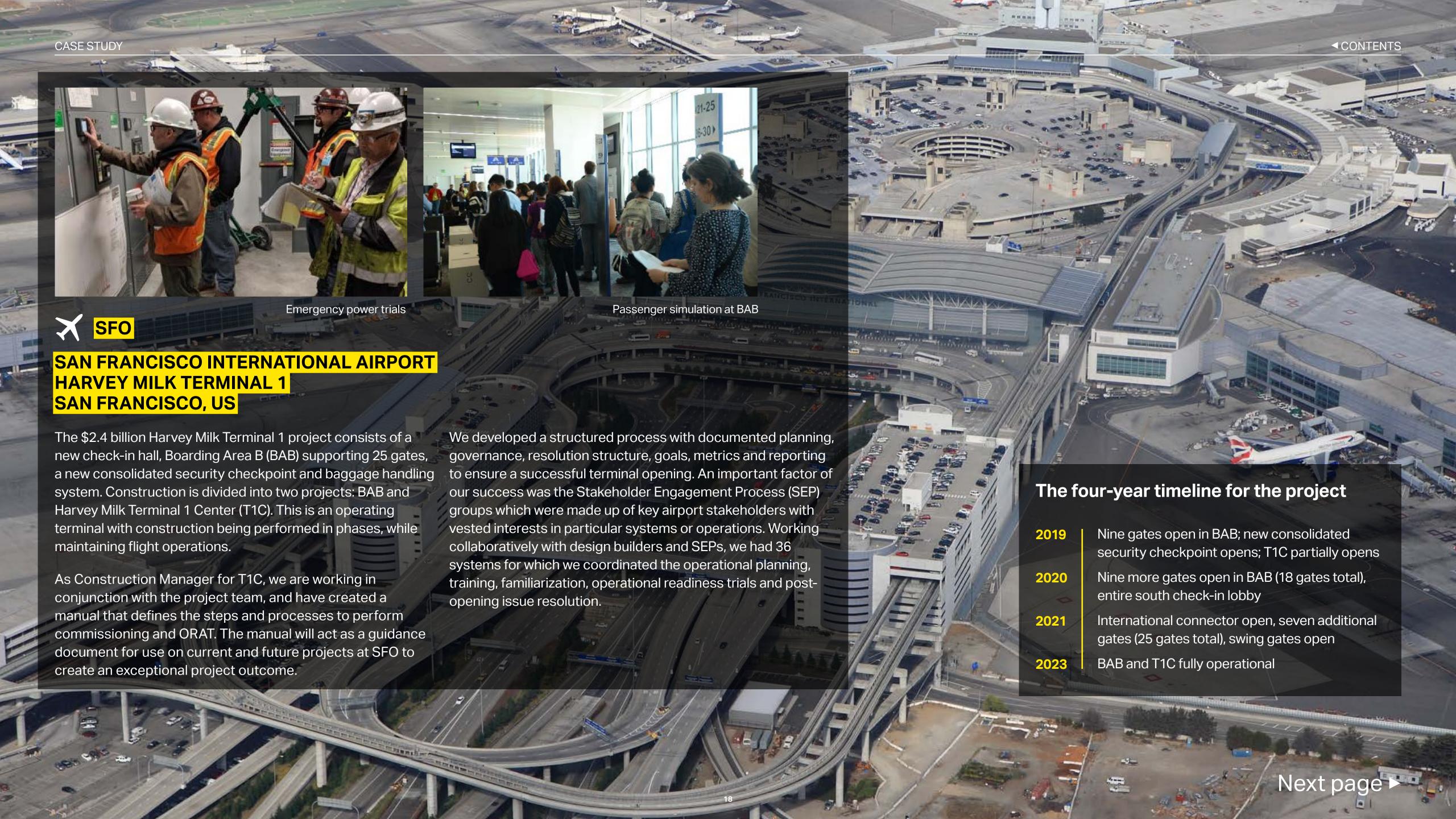
The ORAT process supported the successful delivery of a complex phasing project to replace an existing 10-gate facility with a new 14-gate concourse, while maintaining airport operations. Additional projects include Federal Inspection Services and a Checked Baggage Inspection System.

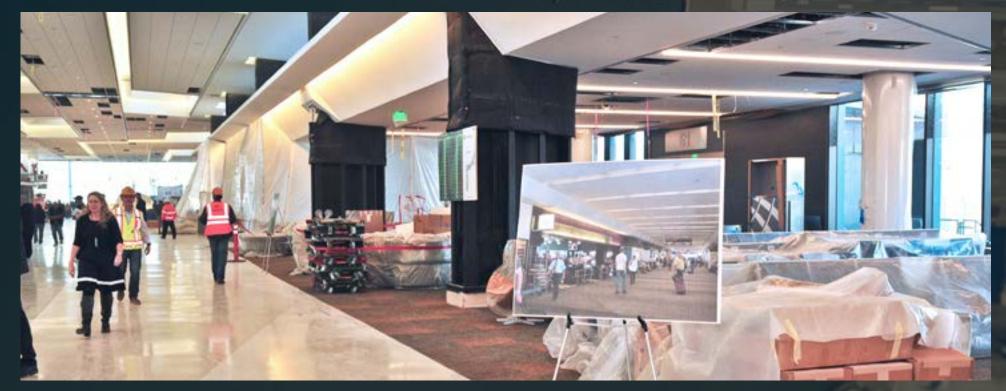
We also implemented OREx (see page 14) to manage the client's complex transition from temporary off-site administrative offices to a consolidated office building located on top of the new 14-gate Concourse H.



Next page ►











### SAN FRANCISCO INTERNATIONAL AIRPORT **TERMINAL 3 BOARDING AREA E** SAN FRANCISCO, US

The \$138 million Terminal 3 Boarding Area E (BAE) project included a building expansion and remodel to the concourse floor area. The additional square footage helped expand hold rooms and provide appropriate seat counts for the aircraft fleet mix, as well as revenue-generating concession space and additional passenger amenities. The project improved the many terminal systems and building components that had reached the end of their useful life and enhanced security by improving access control, paging, fire protection and fire alarm systems, and IP-based CCTV systems.

We helped develop and execute the ORAT program to test if existing procedures worked well for the new facilities. This provided an opportunity to test the new operational and effectively, as well as ensuring that staff were prepared to resolution alongside the QRTs. manage the new facility.

Operational readiness trials were performed on all major systems that impact public customer service activities. The trials ranged from extensive testing and operation of integrated systems such as the baggage handling system and flight information system, to simple systems such as water fountains and courtesy phones. The goal was to anticipate, to the greatest extent possible, the needs and requirements of the traveling public.

Planning was developed through developing Quick Response Teams (QRT) of key airport stakeholders with vested interests in specific systems or operations. Working collaboratively with design builders and QRTs, we developed the activation procedures, and helped coordinate the operational planning, procedures and assess whether they can run more efficiently training, trials, passenger simulation and post-opening issue

The project was opened to travellers on January 28, 2014.

#### **Fast facts**

Scale

Capacity to serve 10,000 passengers per year

Investment

**Built-up area** 

No. of gates

Retail

Sustainability

\$138 million

6,317 sqm

12 sqm

10

LEED Gold Certification due to sustainable features such as 400Hz aircraft ground power; pre-conditioned air system; minor fuel system modifications; clerestory throughout the terminal; improved heating; ventilation and air conditioning (HVAC) systems.

#### **AUH** ABU DHABI INTERNATIONAL AIRPORT, MIDFIELD TERMINAL COMPLEX ABU DHABI, UNITED ARAB EMIRATES (UAE) Our ORAT strategy is built on a trial methodology that The Midfield Terminal Complex (MTC) expansion program includes a new terminal building that will increase capacity introduced what could be done during construction and operational efficiency to process 30 million passengers to gradually increase confidence and capabilities. The per annum and 65 aircrafts, including multiple Airbus A380s. methodology starts with the unit's 'Demonstration' phase, Fast facts The passenger facilities will include over 27,500 sqm of which focuses on product and linking systems to areas, airline hospitality lounges, a transit hotel, heritage and culture followed by the 'Strips' phase, which connects the operation museum, in addition to car parks, landside and airside roads processes together from facility, process, system and people. Capacity to support 84 million passengers per year. Finally, after the construction completion will be the 'Volume' and ancillary buildings. 11,000 per peak hour. phase where the trial will verify the end-to-end passenger 19.1 Billion AED Investment As the Construction Management Agent for MTC, we journey by emulating day of operations. developed an ORAT trials strategy, approach and plan 750,000 sqm **Built-up area** that is aligned to key construction and systems readiness 65 with 106 passenger loading bridges milestones, which enables the progressive build-up of trials' scope, scale and complexity — ensuring all aspects of 28km of conveyors capable of 19,200 bags per hour operations are thoroughly proven leading up to the airport 35,000 sgm Retail opening date.

Next page ►



## KING ABDULAZIZ INTERNATIONAL AIRPORT NEW TERMINAL 1 JEDDAH, KINGDOM OF SAUDI ARABIA

To support and work towards a successful opening in Saudi Arabia's largest and busiest airport, we are working with the General Authority of Civil Aviation (GACA) to provide ORAT and operational support services for the New Terminal 1 at King Abdulaziz International Airport (KAIA) in Jeddah.

The mega project consists of a new 810,000 square meter terminal building that will serve 30 million passengers per year. The terminal includes an advanced baggage handling system, over 28,000 square meters of retail / food and beverage space, and an advanced airport people mover system. Additionally, a range of support facilities will help service the new terminal, including a new air traffic control tower, fuel farm, load centres, data centres, multi-story car park with 8200 car park spaces, landside and airside fire stations, and more.

We've delivered ORAT and operational support services for the phased opening of the new terminal. The AECOM team, alongside expert sub-consultants in the industry, has helped bridge the gap between construction completion and operations to provide a successful transfer in flight operations and activation of airport terminal facilities.

We have implemented a holistic ORAT approach within the new terminal which includes working closely with the client and the many stakeholders to assure the readiness and functionality of all facilities, infrastructure and systems, along with a focused approach on human resources such as familiarization and training of staff, and the overall identification of manpower requirements and planning.

In addition, we mobilized several key experts in various operational areas to supplement KAIA during and after the opening of each phase including within the airside, terminal and landside operations. The full opening is planned for the first quarter of 2020 in line with the construction completion schedule.

21

#### **Fast facts**

Scale

**Built-up area** 

Retail

Gates

**Check-in counters** 

Immigration counters

Security lanes

Car parking spaces

Additional features

Support facilities

Phase 1 capacity to support 30 million passengers per year. Final capacity will support 80 million passengers

810,000 sqm

28,000 sqm

46 gates equipped with 94 aerobridges

240

128

28

8,200

Advanced baggage handling system (BHS) and advanced airport people mover (APM)

Air traffic control tower, fuel farm, load centres, data centres, fire stations

Next page ►

### GLOBAL EXPERTISE

#### **Americas**

**ATL** Hartsfield–Jackson Atlanta International Airport

**AUS** Austin–Bergstrom International Airport

BOG El Dorado International Airport

**BOS** Boston Logan International Airport **BWI** Baltimore Washington International Airport

**BHM** Birmingham-Shuttlesworth International Airport

**CMH**Port Columbus International Airport

CVG Cincinnati/Northern Kentucky Airport

**DEN** Denver International Airport

**FLL** Fort Lauderdale International Airport

**GRR** Gerald R. Ford International Airport **GRU** São Paulo-Guarulhos International Airport

IAH George Bush Intercontinental Airport

**IND** Indianapolis International Airport

JKF John F. Kennedy International Airport

**LAX** Los Angeles Airport

LAX Los Aligeles Alipoi

**LIM** Jorge Chávez International Airport, Lima

**MCO**Orlando International Airport

MIA Miami International Airport

**MKE** General Mitchell International Airport **MSY** Louis Armstrong Airport New Orleans

**ORD** Chicago O'Hare International Airport

**PBG** Plattsburgh International Airport

PBI Palm beach International

PDX Portland International Airport

PHL Philadelphia International Airport

PHX Phoenix Sky Harbour International Airport

PIT Pittsburgh International Airport

**PNE** Northeast Philadelphia Airport

**PSE** Mercedita Airport **PTY** Tocumen International Airport

**RDG** Reading Regional Airport

RDG Reading Regional Amport

**RIC** Richmond International Airport **SAT** San Antonio International Airport

SCL Comodoro Arturo Merino Benítez

International Airport

**SEA** Seattle-Tacoma Airport

**SIG** Isla Grande Airport

**SFO** San Francisco International Airport

**SJC** San Jose International Airport

SJU Luis Muñoz Marin International Airport Capacity

**TUS** Tucson International Airport

YEG Edmonton International Airport

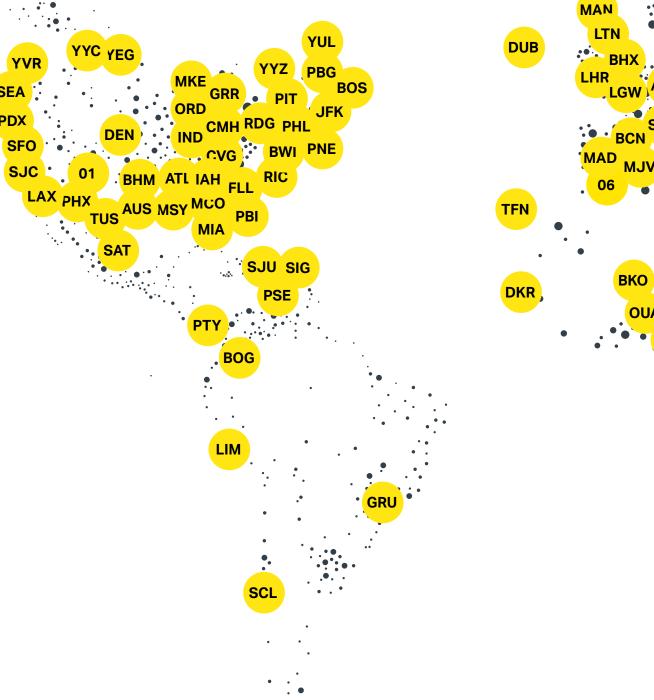
**YUL** Montréal-Pierre Elliott Trudeau International Airport

YVR Vancouver International Airport

YYC Calgary International Airport

YYZ Toronto International Airport

**01** Spaceport America





#### **Europe and Africa**

**ADD** Bole International Airport, Addis Ababa

**AMS** Amsterdam Schiphol Airport **BBK** Kasane Airport, Botswana

**BCN** Barcelona Airport — El Prat

**BHX** Birmingham International Airport

**BFN** Bram Fischer International Airport

**BKO** Bamako-Sénou International Airport

**CAI** Cairo International Airport

**CND** Mihail Kogalniceanu Constanta Airport

**CPT** Cape Town International Airport

**DKR** Dakar international airport

**DUB** Dublin Airport

**DUR** King Shaka International Airport, Durban

**ELS** East London Airport

**FAEO** Ermelo Airport

**FCO** Rome Fiumicino Airport

FIH Kinshasa International Airport

FRW Francistown Airport

**GNZ** Ghanzi Airport **HRYO** Gabiro Airport

IST Istanbul New Airport

**LBV** Libreville International Airport

**LGW** London Gatwick Airport, London

LHR Heathrow Airport, London

**LTN** London Luton Airport

MAD Madrid-Barajas Airport

**MAN** Manchester Airport

**MUB** Maun Airport

**MUR** Murcia–San Javier Airport

**MQP**Kruger Mpumalanga International Airport

**NDU** Rundu Airport

**OUA** Ouagadougou Airport

**PKW**Selebi-Phikwe Airport

**PLZ** Port Elizabeth International Airport

**POL** Pemba Airport

**PRY** Wonderboom Airport

**PZB** Pietermaritzburg Airport

**RCB** Richards Bay Airport

**QRW** Warri Airport

**SAW** Sabiha Gökçen International Airport

**SHO** King Mswati III International Airport **SVO** Sheremetyevo International Airport

**SWX**Shakawe Airport

SZG Salzburg Airport

**VVO** Vladivostok International Airport **WDH** Hosea Kutako International Airport

**WVB**Walvis Bay Airport

**06** Moron Air Base, Spain**07** Greece Independent Engineers Services

08 New Libreville Airport, Gabon09 Air Force Base Makhado

#### Asia-Pacific

**AKL** Auckland Airport

**AUH** Abu Dhabi International Airport

**BGL** Bengaluru International Airport, Bangalore

BIN Bamyan Airport

**BKK** Suvarnabhumi Airport, Bangkok

**BNE** Brisbane Airport **BOM** Chhatrapati Shivaji

International Airport, Mumbai

**BWN**Brunei International Airport **CAN** Guangzhou Baiyun

International Airport

CHC Christchurch International Airport

**CGK** Jakarta International Airport **CMB** Bandaranaike International Airport **CXI** Cassidy International Airport

**DEL** Delhi International Airport

**DOH** New Doha International Airport

**DVO** Francisco Bangoy International Airport **DWC** Al Maktoum International Airport, Dubai

**EBL** Erbil International Airport

**ELQ** Prince Nayef bin Abdulaziz International Airport **GUM** Antonio B. Won Pat International Airport

**HKG** Hong Kong International Airport

HRI Hambantota International Airport

JED King Abdulaziz International Airport, Jeddah KBL Hamid Karzai International Airport, Kabul

**KUL** Kuala Lumpur International Airport

**KWI** Kuwait International Airport

**PER** Perth Airport

**RUH** King Khalid International Airport, Riyadh **MAA**Chennai International Airport

**MEL** Melbourne Alrport

MNL Ninoy Aquino International Airport

MPH Caticlan Airport

NAG Nagpur Airport SIN Changi Airport, Singapore

**SPN** Saipan International Airport

SYD Sydney Airport

TIV Ben Gurion Airport Tel Aviv.

**TLV** Ben Gurion Airport, Tel Aviv **TPE** Taiwan Taoyuan International Airport

**02** Navi Mumbai Airport

**03** SG Express Air Cargo Hub Development

**04** New Xiamen International Airport

**05** New International Airport, Manilla

CONTACT US

### **CONTACT US**

To discuss how our ORAT services can support your airport project, please contact:

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#### Call back

If you would like to speak to a member of our team, please **submit** your name, contact details and query and we will contact you within 48 hours to discuss how we can help.

#### **About AECOM**

AECOM (NYSE:ACM) is the world's premier infrastructure firm, delivering professional services across the project lifecycle – from planning, design and engineering to consulting and construction management. We partner with our clients in the public and private sectors to solve their most complex challenges and build legacies for generations to come. On projects spanning transportation, buildings, water, governments, energy and the environment, our teams are driven by a common purpose to deliver a better world. AECOM is a Fortune 500 firm with revenue of approximately \$20.2 billion during fiscal year 2018. See how we deliver what others can only imagine at aecom.com and @AECOM.

Airports and connecting transportation links are vital to the continued growth and economic prosperity of cities regions and countries. With demand for air travel set to double over the next two decades, airports around the world need to modernize and expand to be ready.

AECOM is a global provider of technical services to airport owners, investors, airlines and aviation clients, leading and supporting programs for airports of all sizes and forms. Building on our global network of expertise and local knowledge, AECOM's multidisciplined, skilled professionals are experienced in delivering integrated, collaborative aviation solutions across projects and continents, from finance and analysis to master planning, program management, design and construction services.