



# INSIGHTS 2018

## **AIRPORTS OF THE FUTURE:**

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Priorities and challenges facing  
the aviation industry

Mace has been providing best in class, innovative airport solutions to our clients for more than 25 years. We have provided construction, management and consultancy services to many of the world's major airports. Our expertise drives innovation, efficiency and value into every project. And it's all delivered with a consistent approach to quality and safety.

Our teams have extensive, first-hand experience in delivering airport projects, combining an exceptional commitment to safety, smart construction methods and a collaborative, client-focused approach to ensure success.

This short collection of thought-pieces reflects on a few of the challenges faced by our clients in aviation.



## MANAGING GLOBAL PROGRAMMES FOR SUCCESSFUL DELIVERY

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**JASON MILLETT**  
COO FOR CONSULTANCY

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*Jason is responsible for our Global Projects and Infrastructure business and is driving our goal to be the UK's leading programme manager by 2020. He has over 30 years' industry experience and leads on some of the UK's most significant projects alongside the largest global programmes.*

*Jason was CLM's programme director for the London 2012 Olympic and Paralympic Games; responsible for the delivery of the Games venues and the commercial closure of the most successful Olympics ever.*

*Prior to joining Mace, Jason was CEO of Bovis Lend Lease while also holding the role of CEO at Catalyst Lend Lease. He is a member of the Heathrow Skills Taskforce and was recently an advisor to the Mayor's London Infrastructure Delivery Board. He is also a fellow of the Chartered Institute of Building (CIOB), the Royal Institute of Chartered Surveyors (RICS) and the Association of Project Management (APM).*

Aviation projects, by their very nature, are often multi-faceted, complex programmes of work, with operational constraints that dictate the delivery conditions and inter-relationships with parts of the airport infrastructure that must remain 'business as usual' throughout the overall design and construction programme.

Managing these constraints, whilst also balancing the stakeholder demands, and those of lenders, shareholders, airlines and the passenger customers of the airport takes a unique set of skills that draws from our experiences across the globe and centres the solution to make it client and scenario specific. We believe that our success in managing major aviation programmes for our clients around the world is down to four key aspects of our service delivery:

Key to the success of delivering a successful programme of works in the aviation sector is **people**. A team must have passion, dedication, drive and a commitment to go the extra mile, working as a dynamic unit with a sole purpose; delivering the vision of the client and ensuring the deliverability of all aspects of the programme.

The sustainable growth of an airport is a key metric that investors and stakeholders will take comfort from when seeking assurances to the deliverability of a major aviation programme of works. **Sustainability** in a commercial sense means that the programme is financially robust, delivers capacity and benefit in line with demand and projections and provides increased employment, local opportunity and also enhanced benefit to the local communities that the airport services.

Further, aviation programmes need to demonstrate a social and energy sustainability credential too, with reducing carbon footprints, resource consumption and generation of new forms of sustainable energy being seen as emerging drivers for aviation projects, increasingly in parts of the world where resources are scarce, or where the opportunity to generate power from heat or the natural climate prevails.

Major aviation programmes should **innovate** in their own context and the key to success of delivering a major programme is the ability for it to demonstrate real innovation to all involved. Mace seeks to innovate in all that it does, be it from demanding more from the design community and construction supply chain. This includes pre-fabrication and de-risking construction to embracing 3D printing of construction materials, use of virtual reality in our design and project review processes and increasing the connectivity and social interaction with passengers throughout the airport journey, to give the users of the facility access to more relevant and consistently informative data to help optimise every passenger's journey.

The fourth key success factor is **responsibility**. All participants in the delivery of a project should take their attributed responsibility seriously. This means ensuring the health and safety of the construction delivery workforce, by designing and planning our projects in a way that make them safe to construct, maintain, operate and, ultimately, to be enjoyed by the passenger community. We believe that, in our capacity as one of the industry's most pre-eminent programme management organisations, we have a responsibility to leave a lasting legacy on all the programmes that we deliver for our clients around the globe. This means ensuring that our programmes not only fulfil their purpose and brief, but also that they provide our clients with platforms for further growth, enhance their reputations in the global marketplace and give increased opportunity for employment and revenue generation in the local business communities in and around the airport complex.

Delivering major programmes of work in the aviation sector is challenging and requires different approaches in different, often conflicting geographies. But Mace's approach and belief in the pursuit of a better way – underpinned by embedding the four success criteria into the core priorities of the next phase of our evolution – enables programmes to be set up for success in whatever country we deliver them in, creating sustainable, responsible projects that delight their passengers and enhance the overall experience.



## EXPORTING UK AVIATION CONSTRUCTION SKILLS

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**MARK REYNOLDS**  
CHIEF EXECUTIVE

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*Mark was appointed Mace's Chief Executive in January 2013, and has been a member of the Group Board since the management buyout of the company in 2001. His vision is for Mace to lead the industry through innovation, be a major British exporter of construction services, deliver a consistent high quality service to clients and that Mace develops, attracts and retains the very best people in our industry.*

*Mark gained his early experience in the commercial sector, later moving on to projects with BAA and was the Deputy Programme Director for the London 2012 Olympic and Paralympic Games.*

*Since 2016 Mark has sat on the board of the widely respected business body London First. In 2017 he was appointed to the UK Government's Construction Leadership Council heading up the skills workstream.*

You wouldn't know it from the way we talk about our roads and our trains, but Britain is a global leader in infrastructure delivery.

Our project and programme delivery is the envy of the world; and companies like Mace are already working in a huge number of countries to help governments and private developers alike deliver vast infrastructure investments.

In aviation, in particular, the UK has a fantastic pedigree of designing and delivering complex infrastructure developments that have revolutionised international air travel.

Our own infrastructure – despite the political arguments over expanding capacity in London – hugely outclasses our European and international rivals.

More than 270m passengers travelled through UK airports last year, compared to a population of 68m – a ratio you won't find anywhere else outside of the US and China.

If you combine all of London's airports, it is the busiest city airport system on earth, and Heathrow Airport by itself – an organisation leading the way in how it procures and delivers new capacity – is the seventh busiest airport in the world overall by passenger volume.

British engineering, architecture and project management are the envy of the world; and we're recognised as a country that has, by and large, developed our aviation infrastructure effectively to help support our economic growth.

From Hong Kong, Mexico, New York and Amsterdam to Auckland, Singapore, Dubai and Taiwan, cities all over the world have taken advantage of the expertise developed in the UK to build and expand their airports.

As we get closer and closer to Brexit, it's more important than ever that Britain's businesses are match-fit and ready to take advantage of the new global trade opportunities that will present themselves.

Aviation infrastructure is a great example of a high quality British export that hasn't had the attention it deserved in the past but has real potential to deliver sustainable economic growth to the UK post-Brexit.

Our construction sector exported more than £8bn in products and services last year; and the global airport development market – with nearly \$1 trillion of new airports and expansions currently in the pipeline – offers a chance to substantially increase that value.

The Government has recognised this already, and begun to throw its support behind the UK's infrastructure export industry in earnest.

Through the Industrial Strategy and the Construction Sector Deal, it is providing easily accessible funding to help ensure that British infrastructure delivery is able to keep innovating and delivering new products and services ahead of the international market.

Infrastructure Exports: UK, a government and industry joint working body announced in 2017, is helping to identify opportunities across the globe for UK companies to work together to form joint ventures and win contracts on some of the world's largest infrastructure investment programmes.

Finally, UK Export Finance – the division of HM Treasury that provides development funding for projects with UK involvement – has extended its credit line to £40bn and is actively seeking investment opportunities to support the appointment of UK companies to international programmes.

Those three initiatives combined will make it easier than ever for the UK's home grown infrastructure experts to sell their products and services overseas.

It isn't now a question of *if* we can build that market – it's a question of how ambitious we can be; whether we have the capacity and the courage to take advantage of the huge opportunity that will now be open to us.



## ENSURING DELIVERY AND COST CERTAINTY IN A LIVE ENVIRONMENT

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**NIGEL COLE**  
AVIATION DIRECTOR, CONSTRUCTION

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*Mace has provided a contracting service offer in the aviation sector since 2001. Nigel was the project manager on that first project and has subsequently established and developed the aviation delivery team into a professional organisation, which has the safety of passengers and the client operational delivery as its top priorities.*

*The team has successfully completed in excess of 200 Construction Management and contracting projects, in the aspects of baggage, pavement, terminal buildings and airline CIP lounges. During this time, Nigel and his team have secured consecutive 'Frameworks' with BAA and more recently Heathrow and Gatwick airports, which have enabled consistent growth and the opportunity to continuously improve the service we offer.*

Mace has spent the last quarter of a century delivering a host of different construction projects for and in the UK's largest airports.

In that time, we've become experts in delivering high quality construction services in a complex and changing live aviation environment.

It's a step change from a standard construction project.

From the outset you have to be conscious that you're working in an airport serving hundreds of airlines and many thousands of passengers.

For construction and project managers, that means an even more complex integrator role than a normal project – how can you deliver your works without interrupting the 24 hour ebb and flow of a fully functioning airport?

The starting point of any project delivery plan is developing a strong understanding of the facilities in which you'll be working and the things that matter most to your client.

That varies from airport to airport – a small number will be more focussed on freight – but for most, the key measure is their passenger service and experience.

That passenger experience is absolutely key to every passenger airport you work in – it's how they measure their performance, differentiate themselves from the competition and support new revenue and growth.

You need to be able to understand and minimise any impact on the passenger experience, as any interruption, delays or negative impact will directly hit airline revenues and airport reputation.

It's a careful balancing act.

The pace of the programme of any works is dictated by how much work you can do without disrupting the passenger experience.

For how long can you close specific airport functions? How much material can you bring in per day? How often can you receive deliveries of material? What happens if something unexpected occurs – like an extreme weather event that changes the capacity of the airport?

Establishing that initial baseline programme requires close work with a whole host of stakeholders.

Beyond the airport itself, you need to be conscious of retail operators, airlines, lounge operators, as well as law enforcement and regulators. Each of these use the airport's facilities in different ways.

The initial programme you produce needs to be detailed and accurate. Disruption at an airport is expensive and challenging – but unplanned disruption is even worse.

Disruption can damage key relationships and building them back up again is very hard – you can only really improve them by achieving your delivery targets time and time again.

Once airlines and other airport stakeholders trust you to minimise the impact on their operations, they will be much more likely to be flexible if unavoidable issues emerge later in the programme.

Our experience has taught us that historical benchmarking against previous projects is vital to judge the amount of operational disruption you're likely to cause.

Once the project is live, you need to make sure you're on schedule for every part of your programme. Detailed weekly reporting will help ensure that you get it right the first time and programme slippage is kept to a minimum before action is taken.

The environment is so complex that defects will be very expensive to go back and fix. Securing new closures to fix work that didn't go well the first time is a guaranteed way to make yourself unpopular with your client and others.

Strong and consistent reporting should give you the ability to flag any potential issues well in advance – but that also relies on great relationships with your specialist supply chain.



If your subcontractors aren't bought into the initial programme and the client service ethos you've developed it won't matter how carefully you plan – you're going to end up failing to deliver. That's why Mace invests so much time in building strong relationships with our aviation supply chain. If we want to continue to lead the way on aviation construction delivery we need to be able to work as a genuinely collaborative team – both with the client organisation and the supply chain.

The live aviation environment is one of the most closely controlled and regulated operational spaces on earth, with tiny margins of time making the difference between profit and loss for a huge number of organisations. The delivery team of consultants, contractors, sub-contractors and client stakeholders cannot afford to get it wrong.

## TECHNOLOGY SHAPING THE FUTURE OPERATING MODELS OF AIRPORTS

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### MATT GOUGH

#### DIRECTOR OF INNOVATION AND WORK WINNING

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*Having joined Mace in 2011 to lead the company's work winning activity, Matt was promoted to Director of Innovation in February 2017. His role, owning the company innovation strategy, and helping to embed a culture of innovation throughout the company, is supporting Mace to realise its ambition to be the catalyst for the next evolution of the construction industry.*

*Matt has supported the top line growth of our construction business from £600m to £2bn in 2017, and he played an important role in some of the business' biggest wins during that time. His career started in digital, having studied computing as part of his BA degree, and he is now aligning Mace's interests with the innovation and technology being driven by the digital sector, as part of the transition to Industry 4.0.*

Technology is defining the future of industry, regardless of sector. The onset of technology to drive efficiencies is unavoidable in this fast developing world. However the pace of uptake and adoption varies considerably across sectors.

Aviation, like construction, is beginning to embrace the principles and engage with the technologies driving the digital transformation of assets, services and skills.

These technological advancements are providing a complex challenge for all industries however never more so than for aviation, which involves many integrated stakeholders across each area of the sector's operation.

Airports are facing greater competition than ever to be the location of choice for airlines.

As airport operators review their operating models in line with technological advances and future trends, a clear understanding of the disrupting influences, its key players, the impact on the existing airport operating systems and the benefits to the passenger and airlines will be paramount to building a robust competitive advantage.

Existing and new technologies are being introduced across airport operations, from improving the passenger journey and reducing time and cost on construction and engineering projects, to redefining airline infrastructure and driving predictive maintenance and operational efficiencies.

### Supporting the passenger journey

As with retail, airports are re-thinking new environments which are digitally connected to support and enhance the passenger experience. These include automated check-in and security points which help shorten the time that a passenger spends navigating the procedural elements of the airport before arriving airside.

Indoor positioning systems, using beacon technology, make it possible for airports and retailers to know where passengers are at any given time in their journey through the airport. Integrating this technology with mobile apps can help improve the travel experience in multiple ways. These include simplifying the check-in process, providing security wait times, walk times to a gate and

other pertinent information. Complemented with augmented reality (AR), the opportunity to enrich a customer journey through an airport presents a real and rewarding opportunity. Combining this with buying trend data from the passengers profile will enable specific retail opportunities to be highlighted at the appropriate stage in the journey, providing tailored exposure for retailers and a bespoke 'concierge' style service for the consumer.

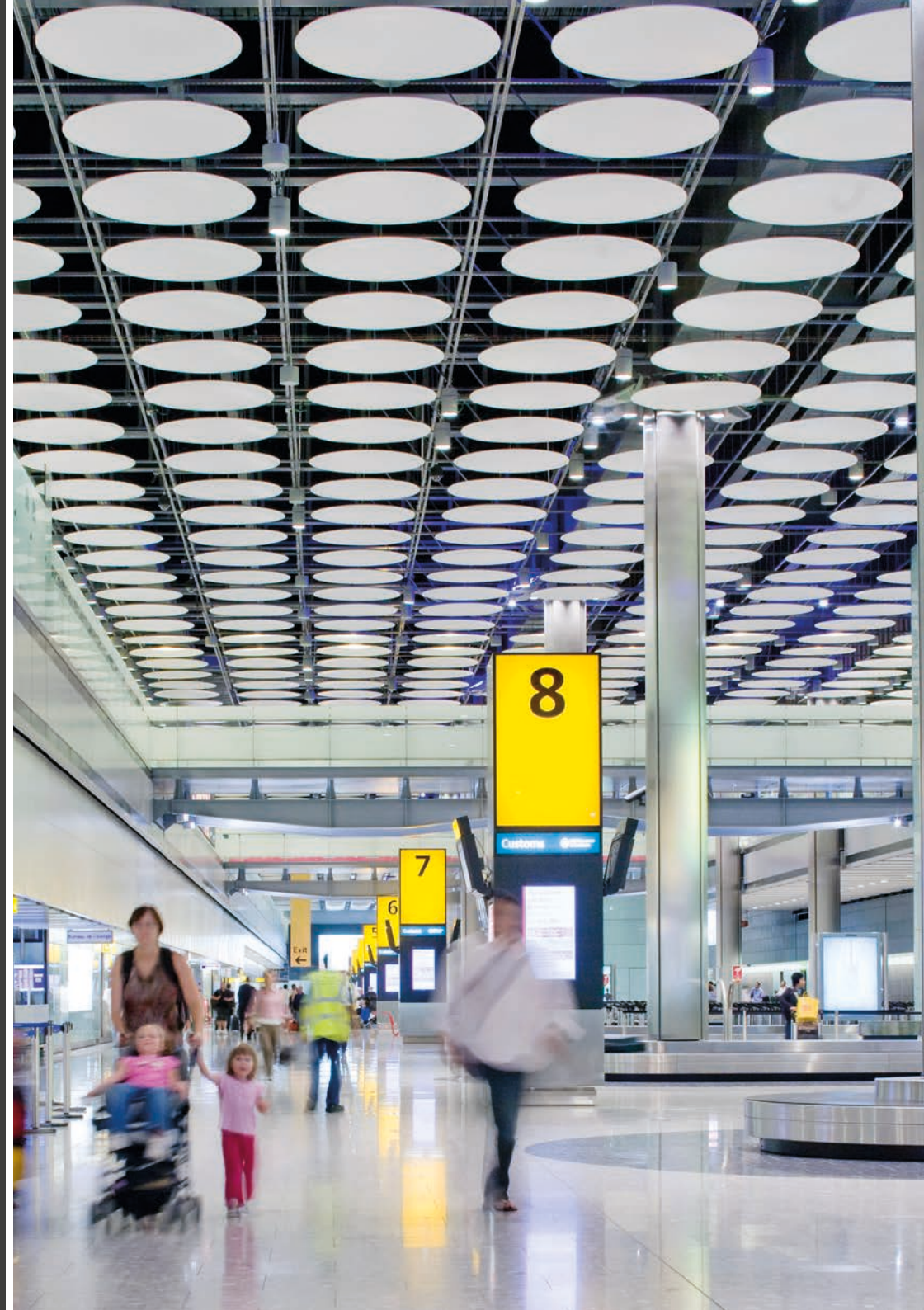
### **Keeping airside operations running**

Advanced GPS technology plays an integral role in ensuring smooth and safe flight movements amidst growing air traffic. It is one of the key enabling technologies being used in updating aeronautical charts and it is being applied to the management of aviation infrastructure. It is also being used in wildlife hazard management programmes to minimize bird and plane collisions.

The industry's digital solution to managing additional air traffic, as more and more new planes are in the air in line with passenger growth, is remote control towers. These virtual towers use a series of video sensors to replicate the view and tracking capabilities of a physical air tower. Air traffic can then be controlled remotely, reducing the cost of operating airports and improving services to regional locations, as seen at London City Airport. Replacing physical infrastructure with virtual replications of the airspace model presents many opportunities for airport estates.

### **Boosting the efficiency of construction delivery**

The use of Building Information Modelling (BIM) has revolutionised complex multi-stakeholder design and construction programmes, simplifying design complexities and construction logistics while predicting future operational needs. Other benefits include ongoing clash detection and reduced discrepancies between different discipline construction documentation, greater predictability of the inputs for construction, overall reductions in costs, improved schedules, faster plan approvals and permits, and better multi-party stakeholder appreciation and communication driving greater client and team confidence and cohesion.



As much as this technology enables construction to build things better, advances in digitisation could also lead to building smarter assets for airport operators. Already, artificial intelligence can be used to automate design processes, supporting the traditional design practice and allowing for more rapid optioneering based on defined parameters and real data. Advances in the manufacturing of construction, enabled by technology, are leading to more efficient, better performing infrastructure assets. A combination of the two may enable airports to become more agile and flexible to meet the current demand of their users. This can be particularly useful for airports that have intensive 'peak hour' periods, where the assets can operate in different modes throughout the day, depending on what the passenger profile is, effectively running in a dormant mode when parts of the infrastructure are not being used.

### **Driving business and operational efficiencies**

Digitisation in the sector is being pioneered by the airlines and their aircraft where the engineering processes and manufacturing techniques are being transformed by new technologies such as use of ultra-light composite materials, 3D printing, robotics and automation, and the Internet of Things (IOT). The use of IOT sensors is underpinning the advancement of Digital Twin technology in engines and aircraft, and can well be mirrored in airport operations.

A Digital Twin, as explained by GE Digital is 'a key technology to fully digitise the physical world'. It refers to 'a digital replica of physical assets, processes and systems'. For example, this technology supports predictive maintenance of an asset by creating 3D models to understand how the equipment will perform. It provides the information in real time on what an asset needs to extend its life and when. Early warnings, predictions and optimisation of assets are all benefits of this technology which, through IOT sensors and both real and predictive analytics, can reduce or eliminate asset downtime.

Predictive maintenance will extend the life of an asset. From airline manufacturing to airport infrastructure, the development of digital twins can support measurable business outcomes, reduce asset downtime and maintenance costs, improve plant efficiency and increase market agility and competitive advantage.

So what does this mean for the airports of the future? Undoubtedly the space required for digital infrastructure will increase, but there will be gains for the smaller space required for pre-security check-in due to faster procedures and processes. This will leave greater space for post-security elements, enhancing the passenger experience, which is the end goal for all operators and airlines. Ultimately, the customer experience from door to plane will be enhanced immeasurably, with the passenger being in full control of the process, and not beholden to lengthy delays. Enabling customers to see where they are going, and to use technology that exists in other areas of their working or social lives, enables them to take pleasure from the experience.

Many of these innovations are now becoming more common place in everyday life, and it is for the airport operators – guided by their delivery teams – to take advantage of these advancements to help them maintain their competitive edge and ensure not only the long-term success of the airport, but to also provide the best possible user experience for the passenger and the airlines.

## AIRLINES AS THE ULTIMATE CUSTOMER – BOOSTING THE AIRPORT VALUE PROPOSITION

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**CARL DAITER**  
AVIATION DIRECTOR, CONSULTANCY

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*Carl is responsible for all of the aviation projects in the Consultancy part of Mace, which covers the full PMO, programme management, project management, cost management and strategic advisory roles across the globe.*

*Carl has worked with aviation clients for the last twenty years, helping them plan, fund and deliver their infrastructure projects in the Americas, UK, Europe, Africa, Middle East, India and South East Asia.*

An airport's value proposition is central to airline decision making when it comes to airport selection.

In this increasingly competitive and technological age, airlines are looking for airport operators that they can trust to keep them flying. Value propositions have become more than just landing fees and financial incentives. More importantly, it's about seamless operations on the ground to safeguard flight schedules and deadlines; and enhanced customer facilities such as premium lounges, car parking products and a comprehensive retail and food and beverage offering to enhance the overall passenger experience.

### **Quality of service = operational efficiency + passenger experience**

Airport operators need to balance the interests of each of their target customers, which includes supporting the airlines' focus on the passenger. As such, airport operators are looking to the future landscape to understand what influences and disruptions the market foresees, in order that they can respond to changing industry requirements and boost their attractiveness to airlines.

Operational efficiencies are essential in all areas of the airport functions. There are shared challenges faced by both the airports and airlines. Ground handling operatives are often third tier contractors, so a passenger might not interact with an airline employee until they actually reach the plane. Passengers will often link their overall experience from car park to plane to destination and back again to the airline, whether events are under their total control or not. So the more passenger-focused the airport environment is, the less tension created between airlines and airport operators.

The digital transformation of the airport environment in terms of its processes and equipment represents both challenges and opportunity. The challenges lie in the investment, skills and resource required. The opportunity is to incorporate IT into the value proposition as technology and digital connectivity will underpin some of the benefits that an airport can deliver to its customers.

The use of mobile apps to guide the passenger through the airport, providing pertinent information can significantly enhance the overall travel experience. Use of Internet of Things (IoT) sensors allows for predictive

maintenance of equipment and assets, such as baggage handling systems and aircraft boarding gates and can also map passenger trends in using the airport. Efficient, integrated solutions like these can add value and real points of differentiation over a competing airport and can provide retailers and the airport operator with valuable real time customer data that is also of beneficial use to the airlines in pro-actively planning their operations.

Smart pre-construction planning drives cost efficiency for both the airport operator and the airline. It is imperative that construction works are planned and delivered in line with a robust and detailed programme, which ensures a safe delivery, on schedule and in line with expectations.

To achieve this, communication is key. Designers, project managers and contractors should work with the airport operator to provide full transparency to all stakeholders over plans and intentions – including new developments, refurbishments and improvements. Proactive signposting of works, which may impact operations and passenger experience, serves to keep the airport open and running. Early visibility of these deviations from the operational norms ensures the pro-active management and mitigation of risk or delay to delivery programmes and disruption to the airlines' schedule. A collaborative approach which involves airlines and key stakeholders in decision making helps to cement relationships between operators, passengers and the supply chain.

Future proofing the airport environment, surrounding infrastructure and surface access routes to support the projected rise in passenger growth is another priority. The attraction of airlines to fly from the airport or expanding their route network from the current location will be central to the success of any airport expansion. The growth of an airport is also a key facilitator of economic strength in the surrounding communities, which can, in turn support the airport in their growth projections by creating jobs, business opportunities and greater connectivity for local exporting organisations.



Most of all, alignment is needed amongst multiple stakeholders to drive effective operations. It is essential that all stakeholders working within the airport environment from designers, project managers, contractors, and the whole of the supply chain, through ground and airside staff to retailers - are all mindful of the passenger and their journey. All must pull together to achieve the quality and consistency of service to ensure operational efficiency and a seamless travel experience underpinning an airport's attractive value proposition. Once this goal is achieved, the airline and airport can operate together harmoniously, delivering a great customer experience and to the mutual financial benefit of all involved.

## AVIATION CHALLENGES ACROSS BORDERS

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**JONATHAN TOMS**  
PROJECT DIRECTOR

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*Jonathan is Project Director at Amsterdam's Schiphol Airport, where Mace in joint venture with Arcadis (AMJV) is delivering the project and construction management of the new pier and terminal as part of the Schiphol Capital Programme. He was previously Project Director at Hamad International Airport Doha, where Mace has been providing project management, cost management and construction management services to the operator since 2009.*

*With over 30 years' experience in the construction industry, Jonathan has worked in both construction delivery and consultancy in the UK and overseas. Many of the projects under his direction have been within complex city centre or public spaces requiring significant innovation in the logistical and technical solutions. The majority of these have required to be delivered within tight time and commercial constraints.*

While each project and location will present unique challenges, all aviation operators, wherever they're based in the world, will also face a number of common issues that will need to be addressed.

Airports are operating in a live, fast-changing environment and are subject to a number of complementary and competing pressures, from more onerous security implications to ever increasing passenger numbers, the needs of the airlines to the growing number of aviation routes being served. All of this needs to be taken into account when planning for major future expansion at all airports around the world.

While the needs of a hub airport are very different to a destination airport, in both circumstances, airports need to be responsive to passenger and airline needs. The important thing for the operator to do is to build in flexibility to future development plans. Not only are airports operating in an uncertain world, but by the time a plan is developed and then implemented, needs may have changed again. Coupled to this is for the client to consider how to build in flexibility without increasing time and cost to the programme.

Indeed, the potential trade-off is often financial; operators need to weigh up whether the intended changes generate revenue and add shareholder value to their asset. And also whether they are enhancing the passenger experience – are they providing sufficiently interesting retail/food/beverage options for passengers, for instance? Airports are often the primary gateway for visitors to a country, and they therefore need to reflect the national image and ensure that the visitor experience is optimised, right from the moment they leave the plane.

Coupled with this, the airport needs to be fit for purpose for airlines, for example providing high quality premium lounges and related facilities that enable their operatives on the ground to deliver great customer service, in order to compete with other rival airports. Indeed, having the passenger experience at the heart of the operator's plans helps to ease stakeholder management when the airlines see that your priority is their priority. High quality surface transport links are also vital for airlines, as passengers will often choose a particular airport based on its proximity to major cities and the ease of onward travel.

And it goes without saying that security is key to an airport's success – both in terms of passengers and baggage. This also has a knock-on impact to any upgrade or expansion works taking place; security of the airport must be maintained at all times during work, while plans must take into account future changes that may be required to maintain and enhance security protocols.

By taking this into account when planning for future growth, they are better able to respond to the needs of passengers and the airlines, as the passenger experience is key to airport's success.

There are key challenges that all airport operators face, and developing a solution for an international airport is broadly the same wherever in the world: early stakeholder management, robust project planning and ensuring the project is financially sound, representing value for money and generating revenue for the airport. Having the right delivery team in place early – one that is aligned to your priorities – can guide you through all these challenges.



## PASSENGER GROWTH: FUTURE-PROOFING AIRPORT EXPANSION

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**KARL LITTLE**  
QATAR COUNTRY MANAGER

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*Karl has a wealth of experience in the aviation sector working in both the UK and the Middle East. He is currently based in Qatar, leading on the operational, contractual and commercial responsibilities in relation to numerous project packages for Hamad International Airport.*

*Previously he worked at Heathrow Airport, responsible for all contractual and commercial activities for the mechanical and electrical installation for Terminal 5A & Terminal 2A, and oversaw operations of a Gatwick office. Outside aviation, Karl has worked across a wide breadth of sectors including health, education, energy and defence.*

Growing connectivity through aviation brings both economic and social value to countries, businesses and individuals – but it comes with its own challenges.

More and more people are taking to the skies, whether due to trade liberalisation, population growth or lower airfares. As a result, airports are faced with crowded terminals and busier skies. With passenger figures set to double by 2035, according to the International Air Transport Association (IATA), pressure on airports and their associated infrastructure is mounting.

When looking at expanding current airports or creating new ones, the issue of passenger growth should be carefully considered. Feasibility studies need to take into account not only the logistical and operational challenges of accommodating significantly more passengers and cargo, but whether the plan will make for a competitive business model. This measured approach is only the first hurdle in a long-term plan for success, with the next key step being a flexible and forward-thinking masterplan.

With airports increasingly mimicking little cities, masterplans need to accommodate for passenger growth not just in terms of additional terminal space but for the surrounding infrastructure. The robustness of transport routes, runway capacity, and accommodation and retail options should be considered. On top of this the physical infrastructure must align with the digital infrastructure.

Solutions should take into consideration not just the sheer number of people, but also the rapid innovations that are changing the way airports work. New technology is increasingly dictating what airports will look like in the future, shaping the passenger journey from start to finish.

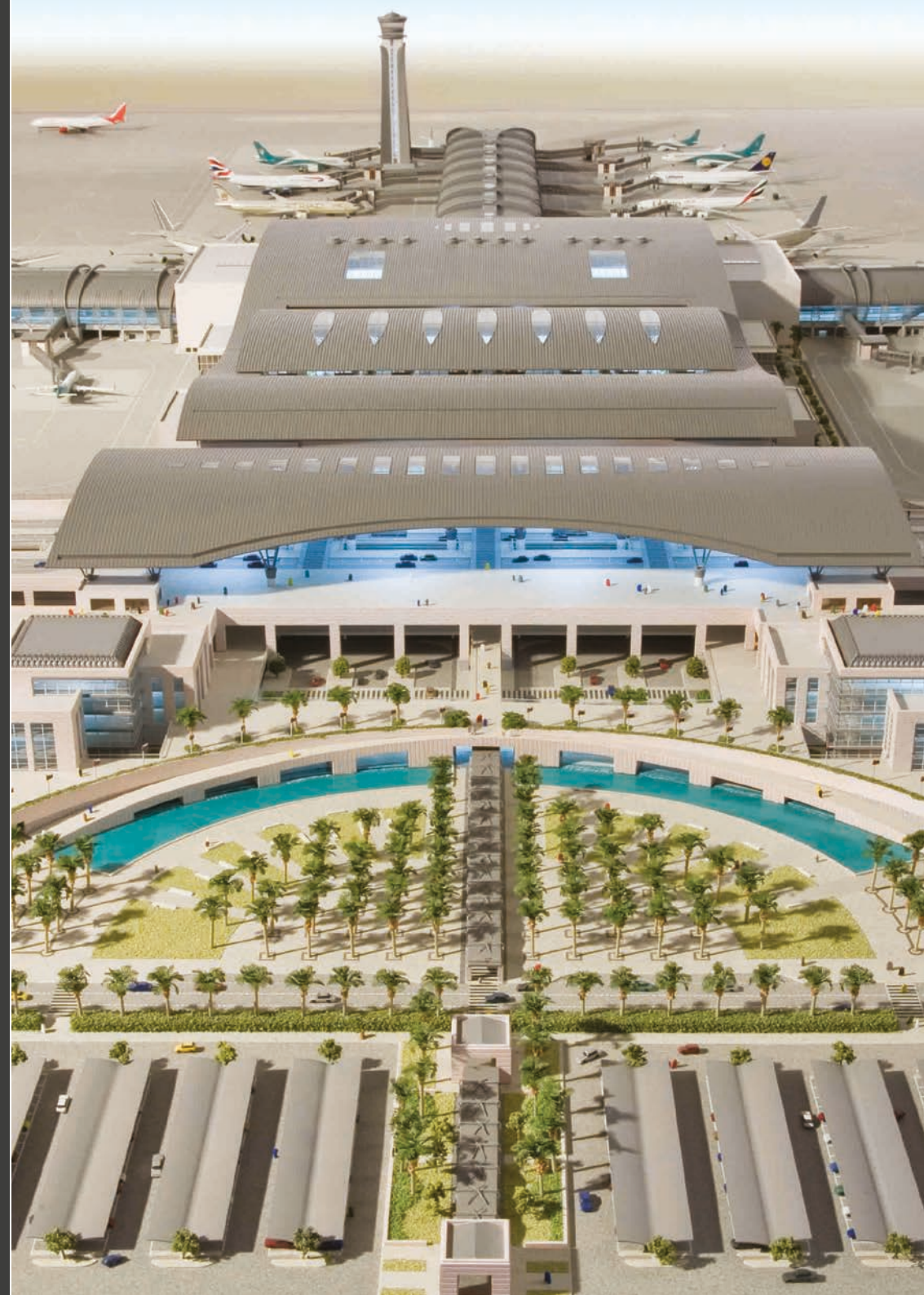
We're already seeing airports moving into more of a self-service model when it comes to security with e-gates, automated bag drops, biometrics (allowing for single-token ID system), RFID for baggage tracking and facial recognition minimising congestion points throughout terminals. There is enormous potential for non-aeronautical revenue created by a stress-free passenger journey.

This move away from time-consuming security checks means airports can focus more on the passenger experience and hospitality. People will be spending less time in lines at security and more time enjoying retail opportunities or using seamless Wi-Fi, which will keep them connected from curbside to the arrivals lounge at the end of their journey.

The way we shop may also change the shape of future airports. Virtual and augmented reality may help generate additional revenue streams from innovations like web-based advertising, which could mean less need for concession spaces and more need for onsite warehouse facilities with people making purchases through mobile technology.

The digital information trails left by passengers can also be capitalised upon, leading to tailored experiences for individual passengers. This customisation will no doubt increase customer satisfaction and, inevitably, revenue.

Airport master plans must embrace new technologies while remaining flexible to the endless possibilities these could bring. Ultimately, being proactive around emerging technology and aligning digital and physical infrastructure will put airports on the front foot in securing long-term success.





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