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The Next Normal

The future of airports: Seamless, automated, and personalized

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Airports have existed for more than a century. New technology could help revitalize their infrastructure—for both air travelers and airport staff. In this edition of *The Next Normal*, we examine how innovations such as AI, biometrics, and flying taxis could transform the airport experience.

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Gate expectations: Perspectives on the future of airports

Tomorrow's airports could feature fewer bottlenecks, less anxiety, and more flying taxis.

Airports have been around for more than a century, and their core purposes haven't changed. But new technologies are poised to transform both passenger experiences and back-end operations. In six videos, McKinsey experts examine how tech innovations could reshape how airports look, feel, and function in the decades to come.

Seamless check-in

Kelly Ungerman: The airport today, I think we would all say, sometimes feels a little chaotic and crowded—full of friction from the time you pull up to the curb to the time that you board at the gate. The airport of tomorrow will feel very different: frictionless, automated, touchless, and personalized.

Vik Krishnan: The airport of the future will fix the biggest problem of today, which is anxiety. Most people go to an airport and they're anxious.

Imagine walking into an airport and not waiting in line for anything. Your bags, to the extent that you have to check them, will be picked up by automated devices that can seamlessly deliver them to the aircraft or the baggage-handling system.

Alex Dichter: One of the most stressful parts of the airport experience for most passengers is security. And it's stressful for many reasons. It's a little bit dehumanizing, but it's also a high source of variability. We never know whether we're going to get through security in three minutes or an hour.

Kelly Ungerman: Security lines are the biggest bottleneck, and one of the biggest friction points in the end-to-end airport journey. In the future, it may not be necessary to stop at all. Biometrics will mean that your face is your new ID. No more physical documents like boarding passes or passports. That is true for check-in, security, and boarding.

Personalized terminals with a wealth of offerings

Alastair Green: I think a lot of forward-thinking airports are going to say, "How can we do more to create a personalized passenger experience?" We all want something very different—not just in how you shop and the items you want to purchase, but even in how you want to have information presented to you.

Kelly Ungerman: When you're in the terminals, the signage will be completely personalized. The departure screen will know it's you. Signs that know exactly where you're going will point you in the right direction—whether to a restaurant, a club, or the gate. It will be in your language, whatever country you're in. And it will help you navigate from the time you enter the airport until the time you board the flight.

Vik Krishnan: You can see airports helping a ton with wayfinding. For instance, AI can be used to make digital signage in the language of choice of the individual traveler, as opposed to just in two languages: English plus whatever the local language is. AI can digitize and personalize that, and deliver a very specific experience if, say, you want your journey to be entirely in Turkish, German, or whatever your preferred language is.

Alastair Green: I would expect that in the years ahead, the best airports will say, "How can we tailor what is offered in the individual stores to the types of flights that are coming in?" They'll know the mix of passengers on board and let you preselect certain items. Maybe you'll buy things that aren't offered at the airport but are delivered there. So, if you're landing at an airport in another country and you know you need a plug adapter or you're missing something from home, you shouldn't need to walk around the terminal looking for that item. You could prepurchase it on the flight so it's delivered to you when you land on the other side.

Steve Saxon: Airports fundamentally are a place where people come to board aircraft. However, there are big opportunities for airports to appeal to the local communities as well. I think we'll see airports become an attractive destination for local people living in the city, as well as people traveling. That will lead to the development of retail, commercial, and business facilities in and around the airport vicinity.

Vik Krishnan: I think an airport has the opportunity to be a convening space for lots of things that don't necessarily have to do directly with travel. An airport of the future is going to be a place, in some instances, where people want to meet even if they aren't necessarily flying that day. It will have an immersive experience in lots of very interesting things, whether that's shopping, world-class restaurants, or experiences that you can enjoy and immerse yourself in without actually having to get on an airplane.

Automation 'below the wing'

Vik Krishnan: There's a lot of work that also happens in an airport "below the wing," which is the stuff that you don't see, and that is also going to be significantly changed in the future. I'm very excited by the prospect of AI technologies helping airlines manage the process of turning an aircraft very efficiently.

It is about the belt loader showing up and helping take bags off the airplane. It is the tug that tows the airplane from the ramp onto the gate. It is the service vehicles that help clean an aircraft. It is the catering truck that brings in drinks and food for passengers to enjoy on the airplane.

Much of that will be digitized—and automated in some instances—and delivered in a way that allows for higher reliability and better on-time performance.

Kelly Ungerman: I think there's a real potential for AI to do better demand planning, so you know exactly where to staff workers, and they show up at the right place at the right time. Another really interesting technology in the context of the airport of the future is autonomous vehicles—to be able to shuttle passengers from one part of the airport to another, or from a large central terminal out to the airplane sitting on the runway. It gives you flexibility to be a lot more modular. I

think robotics are interesting, as well. In everything from gate operations to baggage handling to food and beverage delivery, there is opportunity to be much more efficient.

Steve Saxon: There's a lot of automation possible in airport processes. We have self-driving taxis on the streets of San Francisco, but we still have somebody driving a jet bridge to attach to a plane. Lots of these things—like baggage loading, jet bridges, and passenger buses—will become autonomous.

I don't think we'll have long piers with lots of fingers and gates leading out to aircraft. Why do we want to build big buildings, and why do we want to make passengers walk? I instead think we'll have a fantastic, entertaining central area within the airport and then autonomous shuttles taking people out to board their aircraft just in time for their flight.

More sustainable air travel

Alastair Green: A lot of airports will start to move toward their own on-site green generation, whether that's a microgrid or even production of hydrogen on-site—things that make the energy equation for the airport as a whole work out better. Another item is SAF, or sustainable aviation fuel. Many airports struggle to figure out the infrastructure to deliver that. Over the next ten years, I would expect to see many airports put in place the infrastructure to either generate that fuel on-site, or pipe it in, or have some storage to make sure that fuel is able to get into the aircraft in a practical way.

Kelly Ungerman: I think there's a real question, if hydrogen-powered aircraft become the norm: Do airports have the right infrastructure? Are they making the right investments for the infrastructure that will be required to service very different aircraft from today?

Alex Dichter: Hydrogen-fuel-cell-powered aircraft, pure-hydrogen-powered aircraft—and I think these are probably a little further off in the future than many might think—will require a radical change in airport design. We'll need much larger and different storage tanks for pure hydrogen. If we're using hydrogen fuel cells, we'll need the infrastructure to move them around rapidly. For electric aviation, we'll need the ability to charge batteries and, importantly, to rapidly swap them out. Understanding where these types of things would go and how they would fit into the broader design of airports is absolutely critical if we're going to reach sustainability goals.

Accommodating larger passenger flows

Vik Krishnan: I believe that travel in the future should continue to be available to more and more people around the world, including people who historically were not able to participate in travel—either for economic reasons or because opportunities weren't afforded to them in terms of being able to get from one place to another. That means putting a bit of responsibility on airports, airlines, and all the various players in the travel ecosystem to consider the needs of people who might not be quite as practiced at going through the airport. And they have to do it in a way that makes it very easy for that less-frequent traveler to actually enjoy the travel experience, as opposed to being anxious about it, which is often how they feel today.

Alex Dichter: We've all seen that airports are getting more crowded, and in some cases almost impossibly more crowded. I think one of the biggest challenges for airports of the future is to contemplate future growth and build growth plans that are modular, with facilities that can breathe, if you will, with demand.

The bottom line is that this industry grows at nearly 5 percent and, in some cases, more than 5 percent per year. If we don't contemplate that kind of growth in the design of the physical plan, we will find that the airports we're building become obsolete much more quickly than we imagined they might.

Alastair Green: I think almost anyone who's planning or building an airport is struggling with the uncertainty. Airports can often cope with the raw volume of passengers, but there are bottlenecks in two places that are especially painful. They tend to be around the customer service desks of the major airlines, particularly after some sort of travel disruption, and then at the food and beverage locations, especially around peak meal times. Both of those things can be solved with better technology, which is available today.

An airport full of flying cars?

Alastair Green: Today, many airport passengers choose economy off-site parking, sometimes waiting as long as half an hour for a shuttle bus to take them in. The dream for 2050 would be to have widely available eVTOLs [electric vertical take-off and landing aircraft] or urban air mobility. This might seem like a pipe dream today, but if we can get the cost equation right, people will be able to show up at the airport in some form of autonomous helicopter, essentially, instead of parking a car.

Steve Saxon: If eVTOLs develop as we expect, airports will need to change, because they need to manage the airspace for the long-haul traditional flights at the same time as managing a lower-altitude airspace for what are, in effect, helicopter-like vehicles. That requires innovation. We're still going to have airports, but we're going to have many more smaller flying vehicles going in and out of them, arriving autonomously, with passengers from the city and from the surrounding area. Maybe they'll arrive with groups of four to ten passengers, who will then be connected to a long-haul plane. So the air around the airport will be buzzing with autonomous eVTOLs.

Vik Krishnan: In a world where people arrive at an airport in a flying car as opposed to in a train or a conventional vehicle, you can potentially process passengers through at a remote spot, so that when they get to the airport, they just walk onto the airplane. You could see a world where security processes are performed at a downtown location, where people get on a flying vehicle that doesn't require a runway to take off, and they are transported to the airport's air side—in other words, behind security.

Kelly Ungerman: In terms of a truly disruptive future, there is a scenario where you barely set foot in an airport at all. An eVTOL picks you up in your backyard or on a landing pad that's a block away from you, and it transports you to the airport, right next to the widebody jet that's leaving. You show up ten minutes before departure and never set foot in the airport. That's a pretty disruptive but potentially realistic future.

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These interviews were edited by Seth Stevenson, a senior editor in the New York office.

Watch this and other *The Next Normal* videos on McKinsey.com.

Lim Ching Kiat

October 2025 | Interview

The future takes flight at Singapore Changi Airport

Changi Airport Group's Executive Vice President Lim Ching Kiat discusses efforts to create the airport of tomorrow.

This year, for the 13th time, Singapore Changi Airport was named the world's best by the industry research group Skytrax. It is the world's fourth-busiest international airport according to OAG, serving nearly 68 million passengers in 2024 with a flight operating about every 80 seconds. Changi's Terminal 5, which will add capacity for about 50 million additional passengers per year, is currently under construction and scheduled to open in the mid-2030s.

Lim Ching Kiat is Changi Airport Group's Executive Vice President of air hub and cargo development. He recently spoke with McKinsey Senior Partner Mukund Sridhar about how to capture growth opportunities, harness new technologies, future-proof development projects, and design the always-open "airport city" of tomorrow. The following is an edited transcript of their conversation.

Capturing growth

Mukund Sridhar: You recently celebrated the groundbreaking for Changi Airport's Terminal 5. The terminal is being built with an eye toward capturing new sources of demand. Emerging Asia and Asia–Pacific are expected to be among the largest sources of new travelers worldwide. What is your approach to serving these growing markets?

Lim Ching Kiat: There are three main areas where we can expand our air connectivity. First, to key economic centers. Second, to secondary cities in Asia. And third, to new markets with growth potential.

For existing economic centers like London or New York, which we are already linked to, we think that traffic will continue to grow steadily. We need to make sure our capacity grows in tandem. Today, we have eight daily flights between Singapore and London. We want more.

Singapore's geography also places us in the middle of some fast-growing economies. China, India, Indonesia, and the rest of Southeast Asia have a rising middle class and young populations. Their propensity for travel will increase. I think this forms the key business case for Terminal 5 and for our developments moving forward. We are already connected to most of the key metro cities in Asia, but there are always new cities that are coming up—such as Visakhapatnam in India or Chongqing in China.

There are also other regions where we feel that we are underpenetrated. Central Asia, particularly Mongolia, is an area that we want to grow our links to. Africa and the Middle East are areas that we are constantly looking at. We are aiming to offer more flights to Riyadh—we think the market is there, but we need to work with the right airline partners.

One other potential area which we have been working on is multimodal traffic. For instance, Singapore will be one of the key home ports in the Asia region for Disney Cruises. If a [group of passengers] flies from China to Singapore to board a Disney Cruise, how can we transport their luggage from the airport directly onto the cruise ship without them having to handle it themselves? We're doing trials to explore how we can make the fly–cruise traveler's journey more seamless.

Future-proofing a terminal

Mukund Sridhar: Tell us about how you're future-proofing Terminal 5 in terms of its design, amenities, and facilities.

Lim Ching Kiat: Today, at Changi Airport's terminals 1 to 4, we have a combined capacity of 90 million passengers per annum. Terminal 5 [T5] will add another 50 million to that when the first phase opens in the mid-2030s. One way we are future-proofing T5 is by ensuring that its capacity is modularized as much as possible—that it can be expanded according to future market demand.

T5 is a new type of megaterminal where everything is housed inside one location. While mega-airports and megaterminals are the trend, from a passenger experience point of view, sometimes you go to a mega-airport and you feel a bit lost or overwhelmed. The wayfinding can be a bit difficult, and sometimes the whole experience feels a bit impersonal. So we are trying to leverage experiences from running the current airport to ensure that we cater to different passenger segments—first-time travelers, multigenerational travelers, travelers with disabilities—and make the experience more personable even though it's a big terminal. We want to make sure that the road warrior business travelers can get quickly from point A to point B, but we want to provide families with young children with some distractions to break up a journey and keep things more leisurely. T5 is designed to be mega-yet-cozy. Through architectural gestures and distinct precincts, we've broken down the scale to create spaces that feel warm, inviting, and intuitive—qualities that travelers have come to associate with Changi's existing terminals.

Climate change is another area we are watching. So, for example, the airfield at the Changi East development where T5 is, is elevated 5.5 meters above sea level to help future-proof against unpredictable weather conditions. In the past few years, quite a few airports have been subject to flooding from sudden heavy rainfall.

In terms of our physical design, we need to consider different aircraft, including future aircraft types. We already service a variety of aircraft ranging from small to very large, and our experience with accommodating the Airbus A380, for instance, brought us many useful lessons. For upcoming new aircraft types—specifically, the Boeing 777-9 with foldable wingtips—we are currently in the process of getting the airport ready to accommodate them starting next year. We are also looking at how to accommodate eVTOLs [electric vertical takeoff and landing aircraft]. Of course, we have to manage this in a neighborhood with very crowded airspace. But we are always open to working with the equipment manufacturers and the policymakers on how to service new aircraft types.

Harnessing new technologies

Mukund Sridhar: With the emergence of AI and advanced facial recognition and biometric technology, how do you see technology transforming the flow of security, ticketing, checking in, baggage handling, and so forth?

Lim Ching Kiat: We are trying to harness AI and video analytics as much as we can. For example, we have deployed trials for AI to be used in security screening for detection of prohibited items. Traditionally, at airports, this process is quite manual: you go to a scanner or X-ray machine, and there's a person behind it screening the items. This is the perfect use case for video analytics and AI, and we have done trials that reduce screening times by up to 50 percent. If trials continue to be successful, we hope to scale them up for widespread deployment.

Another area is airside operations. When the aircraft docks at the loading bridge, there are a lot of activities going on—both upon arrival and during predeparture. There are trucks refueling the aircraft, catering trucks, cleaning, cargo loading, baggage, and so forth. We have a pilot project in which we record all these activities and share data from the video analytics with all our partners in airport operations. Whenever some activities get out of step and are delayed, every party handling the flight on the ground gets the information, and we can see how to remedy it. The goal is to keep flights running on time and provide a seamless passenger journey. And so far, the results are quite positive, so we are trialing this further to fine-tune and scale up.

There are also some other areas that we are trying to use technology to solve. For example, lightning strikes: Whenever there's lightning, it can lead to a stop work order on airside. So we are trialing robotics and autonomous vehicles to transport baggage even during challenging weather conditions to ensure continuous baggage flow and timely delivery to passengers. This is an area we are still trying to crack to see how to use technology to mitigate against such disruptions.

Mukund Sridhar: Do you envision autonomous ground vehicles and autonomous cargo facilities being prevalent at T5 and in future versions of Changi Airport?

Lim Ching Kiat: Singapore, like many other countries, is projected to face worker shortages, so automating many of these processes is vital. This way, we leverage technology to free up staff from manual, repetitive work so they can focus on more critical operational tasks. We are already trialing the automated docking of passenger loading bridges for passengers to board the aircraft. This process, which happens several hundred times a day, used to be done manually.

We are also looking at autonomous vehicles and robotic applications in terms of, for example, transporting baggage. The last steps of that can be tricky. Baggage loading and unloading at airports today are still very manual processes. We are trialing certain robotic applications that, if successful, will lead to higher productivity. These trials are already happening in preparation for T5, which will leverage them to automate and digitalize airport operations at scale.

Mukund Sridhar: Could the passenger of the future expect to maybe not have to check in at all—just walk straight through immigration using their face as a passport?

Lim Ching Kiat: One of the key innovations we have started these last few months is passport-less travel. So now at our auto-gate, your face is your passport, and you do not have to use your passport when you go through immigration. That has been very well received, and we are quite happy with that service, and it will be deployed on a bigger scale at Terminal 5.

We are dreaming of other possibilities—for instance, using your face as your biometric token and then putting this token into a biometric wallet that can scale beyond just Singapore. We are keen to see how we can make progress. But at the end of the day, technology is just a skin, and the most important thing is being customer centric.

For example, we've been having this debate within our team: When you get off a plane and you need to know which gate you're connecting to, do you want the information pushed to you via your personal device? Or would you rather look at a big board as most people do today? Some of us feel that the passenger fresh off the plane and still dealing with jet lag might just want to look

at the big board. In the end, either way, it needs to be the customer at the center. The technology is just a means of delivering what works best for them.

Meeting cargo demand

Mukund Sridhar: Changi's made rapid strides as a cargo hub. As e-commerce continues to develop, and with Southeast Asia a growth center in both demand and supply, how are you thinking strategically about cargo?

Lim Ching Kiat: For cargo demand, I think some of the principles are the same as with passenger demand, in the sense that the airport's success is dependent on the success of the whole ecosystem. We can't do it by ourselves. There's no point building a very good airport but not connecting with strong partners.

We understand that e-commerce needs are specific, so we work with partners like airlines and ground handlers to make sure that we have the right infrastructure and specialized handling capabilities to handle e-commerce traffic. Last year, we opened a new facility that is especially suited for e-commerce operations because it has warehouses with runway access.

Creating an airport city

Mukund Sridhar: Looking ahead, 20 or 25 years from now, what are some of your most provocative, wildest theories about the airport of the future?

Lim Ching Kiat: One vision we have is the idea of an airport city. We don't just want to be a bus stop where people come and go. We already have features like airport hotels, but we want to think about how to supersize that. Imagine you could have an apartment at the airport. Or why can't offices be at the airport? For team events, you could just come in for half a day and then get out. There could be a use case for private bankers, or for medical clinics, that want to serve their regional clients and would benefit from office facilities at the airport. With the idea of an airport city, we could redefine some possibilities.

Lim Ching Kiat is Executive Vice President of air hub and cargo development for Changi Airport Group. **Mukund Sridhar** is a senior partner in McKinsey's Singapore office.

Comments and opinions expressed by interviewees are their own and do not represent or reflect the opinions, policies, or positions of McKinsey & Company or have its endorsement.

This interview was edited by Seth Stevenson, a senior editor in the New York office.

For more from Lim Ching Kiat, see the videos accompanying this article on McKinsey.com.

Robert Carsouw

October 2025 | Interview

Amsterdam's 109-year-old airport prepares for its next century

Schiphol Chief Financial Officer Robert Carsouw details the airport's efforts to renew and rebuild with an eye on the future.

The first flight to Amsterdam Airport Schiphol landed in 1916. Today, the airport serves 120 airlines flying to 301 direct destinations—among the most nonstop routes offered by any global airport, making it the second-best-connected airport in Europe. In 2024, Schiphol was the world's 17th busiest airport, processing nearly 70 million passengers, of whom about 36 percent were making connecting flights. The airport has been making efforts to update its infrastructure, including its new Pier A, an expansion of Schiphol's main terminal. The addition, which will provide eight new aircraft gates, is currently under construction and is expected to open in 2027.

Robert Carsouw is the Chief Financial Officer of Royal Schiphol Group, which also operates airports in the Dutch cities of Rotterdam, Eindhoven, Maastricht, and Lelystad. Carsouw, a McKinsey alumnus who joined Schiphol in 2021, recently spoke with McKinsey's Steve Saxon about the challenge of renewing a century-old airport, the promise of data-powered automation, and the importance of investing in improvements to the fundamental passenger experience. The following is an edited transcript of their conversation.

Making an old airport new again

Steve Saxon: What are some of the challenges that Schiphol Airport faces today?

Robert Carsouw: Schiphol was founded at this location more than a century ago. We are the oldest airport in the world still operating at its original location. We need to rebuild our infrastructure, expand it, renew it, and electrify it to become more sustainable, because our old infrastructure is reaching the end of its technical lifetime.

Today, per square meter, we are the most crowded airport in Europe. We just lack space. The last expansion was done in 2005. We are building new spaces now, but anyone who has done construction knows that brownfield construction is much more difficult than greenfield construction.

In the first two decades of this century, our focus was on finding growth without adding costs. And we did grow, from roughly 40 million passengers to about 70 million passengers today. But we didn't always invest or maintain our assets very well. And what we found in 2022, after COVID-19, when passengers started coming back, was that Schiphol had collapsed. We were among the worst-performing airports in the world. The airport was broken in some ways, which became painfully visible from the long waiting lines in our departure halls in 2023.

That was our wake-up call and a turning point. For a long time, there was too little attention paid to employees and their working conditions, and unfortunately, this also applied to the quality of our infrastructure. We have fundamentally changed that since then, and we are well on our way to improving the quality of our airport.

In the past few years, we've focused on rebuilding the airport—both from an infrastructure perspective and an organizational perspective. We outsourced a lot of operational processes in the past, but we're now back to managing our own security and passenger flows. We're also redeveloping our commercial propositions. We need to improve the passenger experience.

We're investing more than a billion euros per year for the next decade and beyond. The airport will have a very different look and feel in the future compared to today.

Future-proofing construction

Steve Saxon: As you develop your new Pier A, how are you future-proofing it so that it will still be relevant in 30 or 40 years?

Robert Carsouw: In general, one of the core capabilities of any airport needs to be master planning. There's uncertainty about the future. How are you going to invest in infrastructure so that it fits in most scenarios going forward?

Specifically with Pier A, we decided that it needs to have very flexible infrastructure, with gates that can be deployed in different configurations to handle up to 11 aircraft simultaneously. The building will let us divide passengers who have different security screening requirements—depending on where they're arriving from—onto three separate floors. It is fantastic architecture, with very large spaces and lots of light. It will be open in 2027, and it will provide additional capacity but also a terrific passenger experience and increased commercial revenue.

Our oldest pier, Pier C, is from the 1960s. It's really worn out. Once Pier A opens, we will close, demolish, and rebuild Pier C. And that will eventually become a much wider and more modern pier compared to the current building.

Preparing for more passengers on bigger planes

Steve Saxon: Projections suggest continued strong future growth for global aircraft traffic. Meanwhile, aircraft types are always evolving. How do you approach accommodating increased aircraft traffic and new types of aircraft while also thinking about your responsibilities to other stakeholders, such as the communities around you?

Robert Carsouw: There is a big debate around Schiphol's maximum capacity. Growth in the number of flights helps bring in more passengers, but it can also affect our neighbors by creating more noise.

We are expecting that the number of flights at Schiphol will stabilize at around 480,000 per year, but the number of passengers will grow faster—from 70 million to 85 million in the coming years. We expect that to happen because of airlines' fleet renewal, which will bring in more passengers per plane. Airlines will fly with less noisy, less polluting, but larger planes.

The expected "upgauging" of fleets to larger planes can create challenges for the airport, because it has been built for planes of a certain size. If the new airplanes are larger than the old airplanes, that means our gates will be too small, and our bridges won't fit anymore. So when it comes to developing new piers and new infrastructure, we take into account the increased size of the airplanes.

That said, the demand from the airlines grows faster than we are able to rebuild the airport. That means that at this point in time, we still have some disconnected handling of planes—delivering passengers on buses rather than through a connected gate. That's not the service we would like to offer. We want our passengers to have a more connected experience. But we foresee that in the next decade or even two decades, we will still need bus operations to make those transitions happen.

Steve Saxon: You mentioned that one challenge you deal with is crowding. Can new technologies, such as AI or biometric technology, help to smooth passenger flows?

Robert Carsouw: I like to believe that Schiphol is a leader on that front. We're forced to be, because we're short on space. We need to make sure we use every square meter of the airport very carefully.

One example of what we're doing is using AI to optimize the turnaround of planes. We have a camera system that analyzes 70 unique turnaround events within 30 turnaround processes, and we share that data with the airlines so they can improve on-time performance. Our image-based processing system can detect impending delays in advance and help us make informed decisions to act on them. We cannot afford to have planes stay longer at gates than planned.

Another thing we're doing is monitoring passenger flows on an individual-passenger level so we can see, in real time, where passengers are—while respecting their privacy, obviously—and make sure that we direct flows to parts of the airport that can support passengers without overcrowding them.

Smoothing cargo flows

Steve Saxon: Schiphol is a key cargo hub for the region. As e-commerce continues to boost cargo volumes, what steps can airports take to cater to this future growth?

Robert Carsouw: We expect that cargo will continue to grow on the back of e-commerce. But in general, the Netherlands is a country of trading. Our imports and exports are huge compared to our GDP, so it's very important for us to get it right. For our hub carrier, KLM, their economic model very much depends on filling their aircraft bellies with cargo.

Schiphol is a very strong cargo hub in large part because all the systems and procedures around cargo have been streamlined together with customs in the Netherlands. We have a well-integrated system where cargo arriving can go through the border quickly and with very limited administrative effort. This reduces costs, reduces complexity, and improves speed, which is very important in e-commerce. In terms of infrastructure, we have built a huge new cargo building that is highly automated and super efficient for all kinds of cargo.

We believe there is further opportunity to automate and simplify processes so that physical flows are not hindered by administrative flows. Making sure that the belly capacity under passenger planes can be fully utilized for cargo requires collaboration with our carriers, including data sharing and establishing joint objectives. So we're working with them on exchanging insights to make sure that that whole process—from outside the airport, through the warehouses, inside the aircraft belly, and back—will run even more smoothly than it does today.

Bridging from the past to the future

Steve Saxon: What are some key things you can learn from looking at lessons from the past?

Robert Carsouw: If you compare an airport from 30 years ago with the airport of today, in many ways the fundamentals haven't changed.

People want to have a predictable process. They want to get through security. They want to get a nice cup of coffee. They want to have clean toilets. And they want to board their planes on time without stress. That's still the objective. But it's not always easy to get that right.

I think at Schiphol and at other airports, there's been a rediscovery that developing and operating an airport in the right way is a complex and difficult project that requires careful attention and investment, master planning, asset development, and asset management. Maintaining assets that have been developed over a period of decades, with many different technologies that are all mission critical, requires lots of expertise, lots of data, and lots of specific skills that often can't be outsourced. We're focused on regaining expertise and taking back control of our airport, and we're making big progress.

Even cleaning toilets sounds very mundane, but it's essential for the passenger experience. A dirty toilet is hugely dissatisfying for a passenger. What we learned at Schiphol is that we went too far in asking other parties to take care of things like that. We have to take ownership.

Steve Saxon: If you had to put on your futurist hat, what are some of your predictions about what could change? And what actions are you taking today to secure the future of the airport?

Robert Carsouw: When it comes to processes, what many airports, including Schiphol, are working on is to have passengers simply walk through the airport without needing to pass through all the gates and the checks. That could be done using biometrics and automatic gates, and it would make flows much more natural and smoother. For passengers, it would be a less stressful and much happier experience.

I would expect that a lot of operations will be robotized and automated in the future. The concept of an autonomous airport that runs like a machine is something that we're moving toward. We're collecting more data in an effort to further automate airport operations. There are thousands and thousands of sensors and cameras in our buildings. That culminates in massive data pools that we're analyzing and using to steer the airport. We already have autonomous wheelchairs for passengers with reduced mobility, who can sit in the wheelchair and be autonomously driven through the airport. I'm sure in many different areas, that kind of automation will continue to develop.

In the future, technology will be more important. And passenger behavior could be different. But, as I say, the fundamentals will stay the same. Even in 20 years, the essence of what the airport is doing will not change.

Robert Carsouw is the Chief Financial Officer for Royal Schiphol Group and an alumnus of McKinsey's Amsterdam office. **Steve Saxon** is a partner in the London office.

Comments and opinions expressed by interviewees are their own and do not represent or reflect the opinions, policies, or positions of McKinsey & Company or have its endorsement.

This interview was edited by Seth Stevenson, a senior editor in the New York office.

For more from Robert Carsouw, see the videos accompanying this article on McKinsey.com.

Michael Swiatek

January 2024 | Interview

A flight plan for everyone

Senior airline executive and inclusion advocate Michael Swiatek outlines the changes required to enhance travel experiences for those with disabilities.

Air travel is particularly daunting for passengers with disabilities. Getting to and from the airport; navigating security checkpoints; moving through large, noisy crowds; and getting on and off an aircraft can all present unique obstacles for those with auditory, visual, cognitive, or other disabilities.

Longtime aviation executive Michael Swiatek wants to help clear the runway for travelers with disabilities—or, really, for any travelers needing assistance. “As societies age, more and more people are becoming less and less abled,” he notes. “Eventually, we’re all going to need some kind of help.”

Swiatek is the chief strategy officer at Abra Group, a holding company for Latin American airlines Avianca and GOL. He is also legally blind. In this interview with McKinsey’s Eliza Cooper and Roberta Fusaro, Swiatek outlines the societal, operational, and economic considerations involved with improving air travel for all and conveys his optimism for the “golden age of accessibility” that he believes we’re experiencing now.

This conversation has been edited for length and clarity.

McKinsey: Why are the topics of inclusion and accessibility so important to you?

Michael Swiatek: I’m a 60-year-old White male with a bald head and white beard. I have been blind/low vision since birth. The eye disease I have is retinitis pigmentosa, which is severe night blindness and a lack of peripheral vision. And I’ve slowly been getting closer and closer to total blindness over the past 60 years. And that has given me the opportunity, as a person with disabilities, to learn about this issue firsthand—and to navigate the tricky world of business and airlines.

McKinsey: How have society’s and the business world’s views on disability inclusion changed since you started your career?

Michael Swiatek: The Americans with Disabilities Act was signed in 1990—about halfway through my journey. Since then, the awareness has greatly improved—so much so that I personally believe that we’re in a golden age of accessibility. The supports available today are better than they were 30 years ago. A lot of that credit goes to smartphones and advances in their operating systems. The things I can do as a blind/low-vision person with my smartphone today are incredible. I can take a snapshot of a menu in a restaurant, and my phone will read back to me what’s on the menu. I can use AI to ask questions such as, “How many dishes on this menu have chicken in it or are vegetarian?” It’s getting better every year. But it does take time.

McKinsey: Can you talk a little about how your visual impairment has affected you professionally?

Michael Swiatek: Well, early in my career, when I had a little more eyesight but still not enough to drive a car, my biggest challenge was getting to and from the office. I didn't want to disclose [my visual impairment] to everybody, because 30 years ago, it did feel like there was some bias. As soon as I would mention it in an interview, for instance, the tone would change. People would focus on the wrong things. They would ask, "But how are you going to get to work if you don't have a driver's license?" And I would say, "I'll take care of myself with public transportation, or my wife will drive me."

But one of the advantages that I get from being a blind/low-vision person is it has really enhanced my ability to memorize. It's made me a planner. And I believe it's made me a better listener. Authenticity, empathy—these are buzzwords for leaders today. Well, I can't help but be empathetic because I need other people's help. I've worked for a lot of CEOs in my career, and they have all responded favorably when I've asked for their help and said, "Hey, can I put my hand on your shoulder, and can you lead me to the conference room?"

Through that sort of interaction, I get this quiet time alone with CEOs, board members, managers, analysts, secretaries, janitors. They remember me and bond with me a lot quicker. There's no reason to feel sorry for me—in many ways, I feel like this has been a benefit to building my career, not a disadvantage.

McKinsey: What air travel obstacles do people with disabilities typically face?

Michael Swiatek: At Avianca, we looked at the touchpoints in a typical customer journey across four major categories of disability—auditory, cognitive, mobility, and visual. We found about 90 pain points—things as simple as getting off a plane and finding a restroom or other services if you are a blind/low-vision passenger, and as complicated as trying to fit a wheelchair on board a plane [see the sidebar, "Challenges at every turn"].

Challenges at every turn

For individuals with auditory, cognitive, mobility, and visual disabilities, an international or cross-country flight can pose any number of obstacles.

Challenge: "Airports are overwhelming for me."

The overall sensory experience of an airport, including going through security, may be especially challenging for someone who is neurodiverse. Some airports have sensory rooms, which can provide a calming space where someone can go if things become too stressful.

Challenge: "I have trouble hearing airport announcements."

Because gate and in-flight announcements in airports are made over public-address systems, someone who is deaf or hard of hearing might miss important information about boarding times, gate changes, flight delays, or other diversions. Fellow travelers can help. If you notice that someone is still sitting in a boarding area 15 minutes after everyone else has made their way to the new gate, ask if they could use a hand.

Challenge: "I find airplane aisles and lavatories tricky to navigate."

For someone who is blind or low vision, it may be challenging to locate seat numbers, signs, and buttons on an aircraft. Some airlines are starting to add braille numbering to each row of seats, as well as LED lighting in lavatories that highlights the "flush" button.

Wheelchairs probably pose the biggest challenge for the industry and a real engineering challenge for manufacturers. Wheelchair users can't take their own wheelchairs on board an aircraft, and the process for loading wheelchairs into the cargo hold of an aircraft varies depending on who made the chair, how it's been designed, the manufacturer of the aircraft, the size of the cargo door, the size of the cargo hold, the layout of the airport on the tarmac, the training of the ramp agents—it goes on and on. And if you load all the weight in the back of the plane first, sometimes the tail of the plane tips down. A wheelchair can weigh more than 300 pounds. Someone has to be thinking about how to load multiple wheelchairs on a plane so that the process doesn't create flight delays, damage to the plane, or damage to the chairs. We're identifying more and more of these kinds of pain points. We just need to tackle them one by one.

McKinsey: You've developed a perspective—actually, a framework—for how to do exactly that and create more disability inclusion in air travel. What does it involve?

Michael Swiatek: There are five key tools: we need to raise awareness of the issues people with disabilities face. We need to provide ongoing training for airline employees—in leadership and on the front line. We need to explore process reengineering. We need to take advantage of digital technology. And we need to manage what I call the "hardware" of accessibility.

McKinsey: What does "hardware" refer to in this case? The actual nuts and bolts on a plane?

Michael Swiatek: A good example of hardware is an accessible lavatory, which airlines can buy as a unit from a supplier and install on their planes. The lavatory has expandable walls, which allow enough space for a wheelchair to be able to turn 360 degrees or for two people to fit inside. This would allow wheelchair users to get in and out by themselves.

Here's another example: I recently noticed that the flush button on the plane I was on was outlined in LED lighting, and I was amazed because finding the flush button on most airplanes is very difficult for blind/low-vision people. Using LED lighting in this way, or using braille on seat numbers, is a great help.

Here's one more example of what I mean by hardware: airports could offer autistic passengers a dedicated sensory room that would help them feel comfortable traveling, so the two hours spent in a terminal wouldn't be as stressful.

McKinsey: Is there sufficient time, management attention, and funding to invest in this hardware, given everything that the travel industry has been through the past few years?

Michael Swiatek: Accessibility, like any issue, is always difficult to prioritize and find time for. It's a hard balancing act at *all* companies and in *all* industries, and ours is one of the more complex industries to manage through. For example, the average profitability per passenger in 2022 was $2.25, which, to have the return on capital to invest, should be something more like $10 or $12. And if we need to account for the cost of assistants who can push wheelchairs and help people with physical injuries or disabilities get to the gate, that one trip can cost up to $60. The finances are tough, no question. But transportation is a human right; we need to make accessibility affordable.

McKinsey: How do you envision collaborating with other stakeholders to do that?

Michael Swiatek: Well, it definitely needs to be a collaboration rather than a competition—from the wheelchair manufacturers to the aircraft manufacturers to the airports to the airlines, and so on. It's starting to happen. I was at the International Air Transport Association's World Passenger

Symposium in Chicago. Accessibility is a track, or topic, that they started offering in 2018, I believe. The attendance is growing every year, and the ideas are getting better and better. My contact list now is over 1,000 people and reaches all over the world. The start-up environment, the entrepreneurism—there are hundreds of smart people trying to solve [accessibility] problems. For instance, there are now autonomous wheelchairs that can guide passengers through the airport rather than passengers relying on humans to push the wheelchairs. The collaboration is already happening.

McKinsey: What metrics or indicators will you use to track progress against accessibility goals in air travel?

Michael Swiatek: The key performance indicators [KPIs] are clear: we want to reduce the number of complaints. We want to reduce the number of broken wheelchairs. One KPI we're developing involves circumstances in which stairs are used instead of a jet bridge to get passengers on and off the plane—that is, we want to ensure that the flights with more passengers with disabilities are the ones that get assigned to the jet bridges. The outcome we want is better-served passengers who are happy and will fly with us again.

McKinsey: We've talked about how airlines can help passengers with disabilities. What can airlines do to build awareness and empathy among their own employees?

Michael Swiatek: That awareness really needs to start with our educational system. I get a little frustrated that, when I'm hiring a 25-year-old flight attendant or check-in agent, I have to teach them about disability awareness and inclusion. It feels like this is something they should've learned when they were six years old, nine years old, 12 years old. According to various resources, about 15 to 20 percent of the population has a disability. You're going to run into these people. You're going to work with these people. We need to build that awareness through our societal institutions, not just wait until someone has a customer-facing job and choose that time to teach them about disability.

But what companies can do is start talking to people with disabilities, and start including them in their C-level board discussions. It's important to build external advisory committees of people with disabilities to use your products, give you feedback, and help you design products in a more universal, commonsense way.

You need that representation. In my humble opinion, my company has been able to make the progress it has, in part, by my being in the C-suite. The CEO is my colleague and my friend, and he can't ignore the fact that people exist who are blind and low vision. And because he's super engaged in it, guess what? So is the rest of the company.

Companies also need to emphasize ongoing training in this area. It can't be, "Here's a 400-page manual. Read it." That's not going to stick with people. At Avianca, we're building very short, 45-second clips where I explain what a mobility cane is. We're filming short videos with members of our external accessibility group, which includes people with different disabilities, and they are reminding people, for instance, "This is my wheelchair. It's like an extension of my body—please ask permission before you touch it." We're also in the process of creating a laminated card with dos and don'ts that employees can use when interacting with people with different kinds of disabilities.

McKinsey: What advice do you have for other leaders—inside and outside the travel industry—on how to promote more disability inclusion?

Michael Swiatek: You can't regulate human kindness. You can't regulate common sense. You can't regulate empathy. But I do think we all just need to be a little more kind with one another. If you're at the airport, and someone is sitting there quietly, and you notice that everyone else has left the boarding area, and that one person still sitting there 15 minutes later, maybe they didn't hear the announcement that the gate has changed. Ask if they could use a hand.

We just need a little bit more civility in the world right now.

Michael Swiatek is chief strategy officer at Abra Group. **Eliza Cooper** is an editor of inclusive publishing in McKinsey's New York office, and **Roberta Fusaro** is an editorial director in the Boston office.

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For more from Michael Swiatek, see the videos accompanying this article on McKinsey.com.

Preparing airports for more planes and passengers

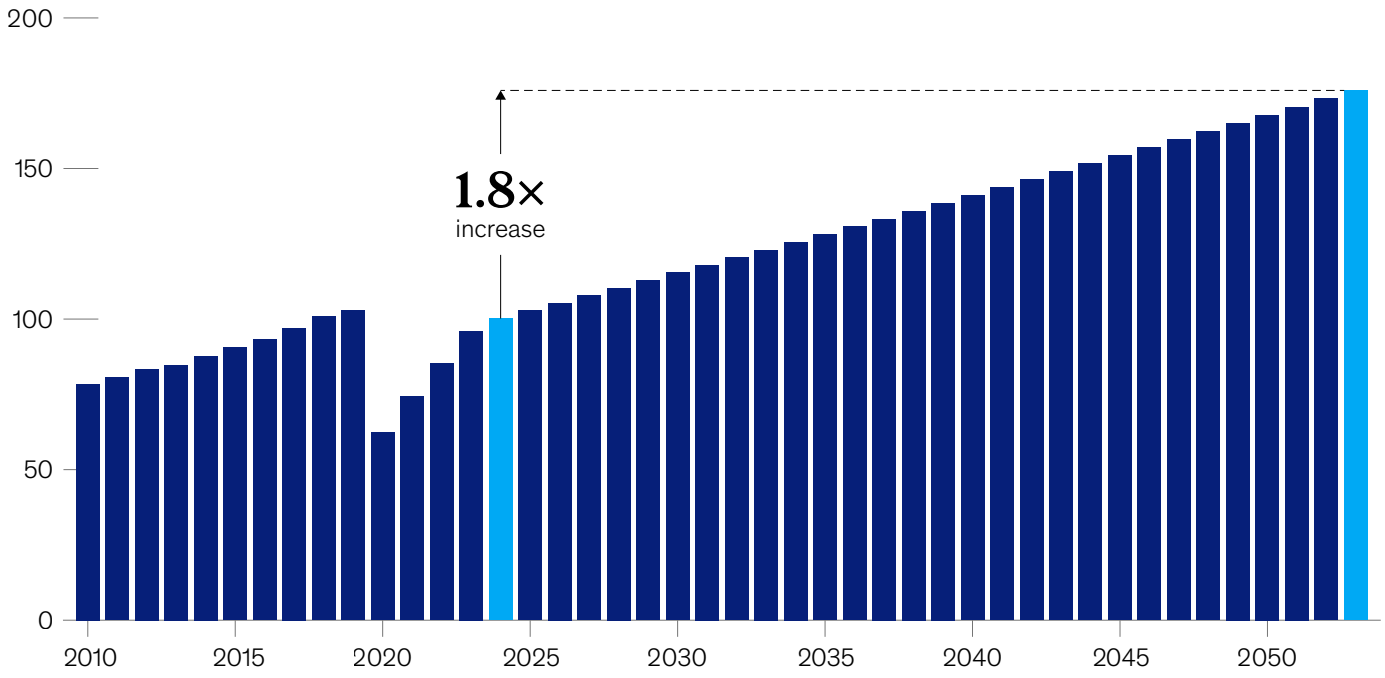
After a dramatic dip during the pandemic, global aircraft traffic has steadily recovered. By 2053, annual aircraft movements (meaning takeoffs plus landings) are expected to reach nearly 176 million—about 1.8 times more than in 2024.

That means busier airports are on the way. Today's airport executives are planning for a future in which more planes will need to fit on runways and at gates, and more passengers—including many first-time air travelers—will need to pass through security, bag check, and boarding processes.

Read more about the state of aviation

Global air traffic is projected to rise steadily for the next few decades.

Global annual aircraft movements, million



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