# Five Must-Know Aviation Insights for 2021

SATAIR

AN **AIRBUS** SERVICES COMPANY

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# Introduction:

**Following a year unlike any other, the aviation industry faces historic challenges and a long, uncertain road to recovery.**

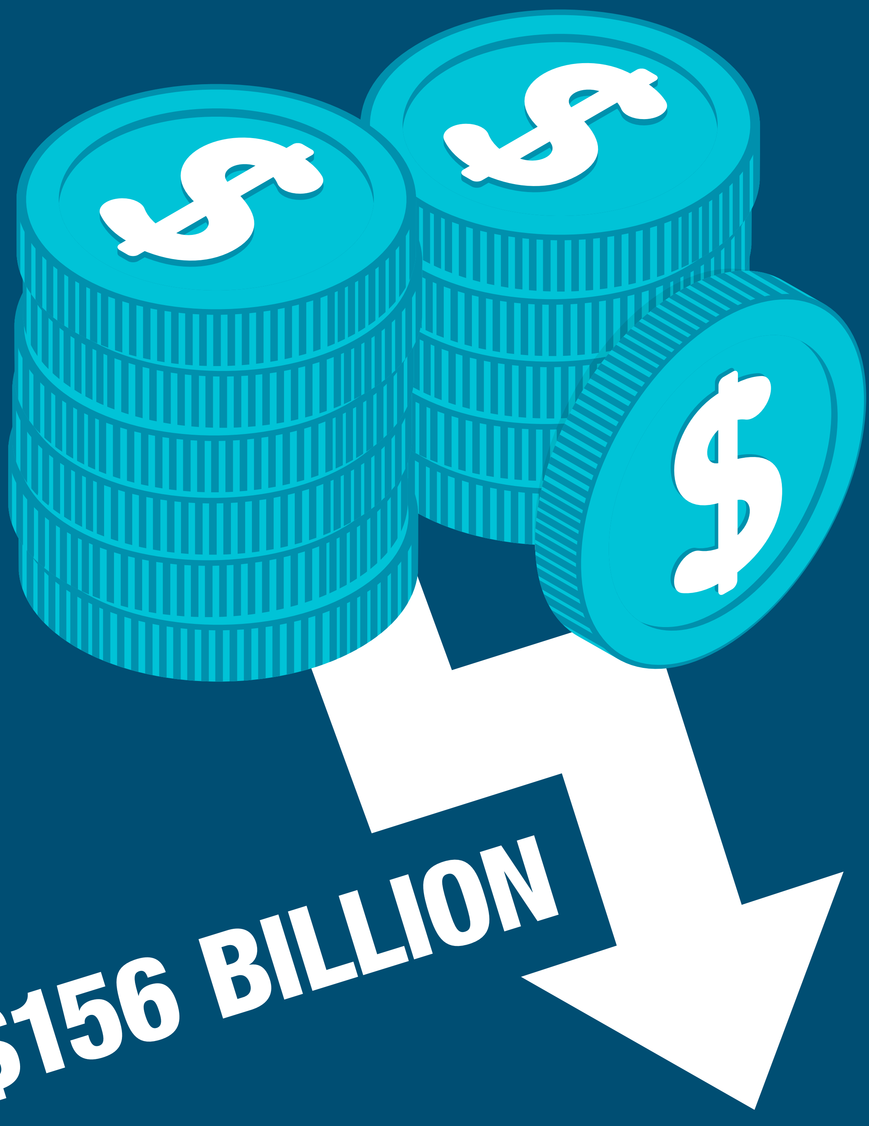
Let’s get it out of the way right off the bat: 2020 was a terrible year for aviation. The COVID-19 pandemic caused the worst crisis in the industry’s history.

Global air traffic came to a virtual halt when governments around the world imposed lockdowns and border closures. At its worst point, an unprecedented two-thirds of all mainline passenger aircraft were grounded after travel demand fell off a cliff. Year-on-year passenger numbers declined 61 percent and the industry as a whole lost an estimated $118 billion.

# Historic losses

**The global aviation industry suffered net losses of $118 billion in 2020, according to the International Air Transport Association.**

**An additional $38bn in losses are expected in 2021.**



> “
> **The history books will record 2020 as the industry’s worst financial year, bar none.**
> ”

**Alexandre de Juniac**
Director General and CEO,
IATA

The coronavirus pandemic didn’t just produce one bad year, it wiped out two decades of passenger growth and marked an abrupt end to what many expected to be a prolonged golden age for the industry. The next several years will be spent simply trying to crawl back to pre-COVID levels.

Demand is not expected to fully rebound until 2024 at the earliest and passenger

behaviours could take even longer to return to normal.

Now that video meetings and virtual conferences have become the norm, there are real concerns that attitudes toward business travel may be permanently altered.

At the end of Q1 2021, the course of the pandemic, the speed of vaccinations and the fate of the wider economy were still very much uncertain. Much of what happens next is out of airlines' direct control. But not everything.

In this eBook, we are going to look at five areas that will be vital in getting through the immediate crisis and preparing for the recovery ahead, starting with what is arguably the most important of all: ensuring travellers that it is safe to fly.

# The Satair Takeaway

**“I’ve faced adversities with bankruptcies, SARS, 9/11, mergers at different airlines and I’ve never seen a situation like this before. We’ve managed 2020, we face headwinds that will present challenges in 2021 and 2022.”**

**Paul Lochab** is Chief Commercial Officer at Satair, where he is responsible for the global activity of both Satair and Airbus materials.

Throughout this eBook, Paul will offer insights and analysis based on his three-plus decades of experience in the aviation industry.

Chapter 1

# Passenger safety concerns

**When travel restrictions are lifted, passengers need to feel confident about their safety on board. The aviation industry is approaching COVID safety in a number of ways.**

One of the biggest challenges that airlines can control is reassuring the public that it is safe to fly.

Luckily, both science and traveller sentiment are in the industry’s favour.

# Low risk of viral transmission

Numerous studies carried out by industry players, external researchers and regulatory agencies have found that the risk of viral transmission on commercial flights is quite low. Aircraft cabins' physical layout, airflow patterns and existing High-Efficiency Particulate Arrestors (HEPA) filtration systems create barriers that replicate physical distancing standards within a confined space.

"We have concrete data which reveals the aircraft cabin offers a much safer environment than indoor public spaces," Bruno Fargeon of Airbus Engineering said. "The way that air circulates, is filtered and replaced on airplanes creates an absolutely unique environment in which you have just as much protection being seated side-by-side as you would standing six feet [two metres, ed.] apart on the ground."

A study from Harvard University's Aviation Public Health Initiative reached similar conclusions. It found that when commercial aircraft implement a "layered approach" to safety that combines onboard ventilation systems, face masks, distancing protocols, surface disinfection, and passenger declarations that they're COVID-negative, air travel is as safe or safer than other daily activities like grocery shopping.

Similarly, Dr. Henry Ting of the internationally-renowned Mayo Clinic said that models conducted at his facility found that "the risk of COVID-19 infection – on a flight that is 60 percent full – should be nearly one in a million" when airlines combine testing with mandatory mask requirements, proper social distancing and surface cleaning.

To complement existing onboard safety features, a number of airlines are also turning to cutting-edge solutions like bipolar ionisation purification that add a layer of additional protection, as well as new technologies like UV wand sanitizers.

# Passengers confident about onboard safety

The flying public seems to have faith in the safety measures being implemented by airlines. Passengers have indicated that some of their biggest concerns about flying are air and cabin cleanliness, but travel sentiment surveys from the consulting firm Oliver Wyman found that travellers felt more and more comfortable with the idea of flying as the pandemic wore on.

In a study tracking traveller attitudes during the pandemic released in October, half of all respondents said they would feel comfortable taking a flight once the outbreak ended and travel restrictions were lifted. Moreover, flying was the mode of transportation that travellers trusted most in the survey, outpacing their comfort in renting a car, using rideshare, taking a train, going on a cruise or using public transportation.

> **Our goal must be to restore the confidence of passengers and to reach a new normal in aviation.**

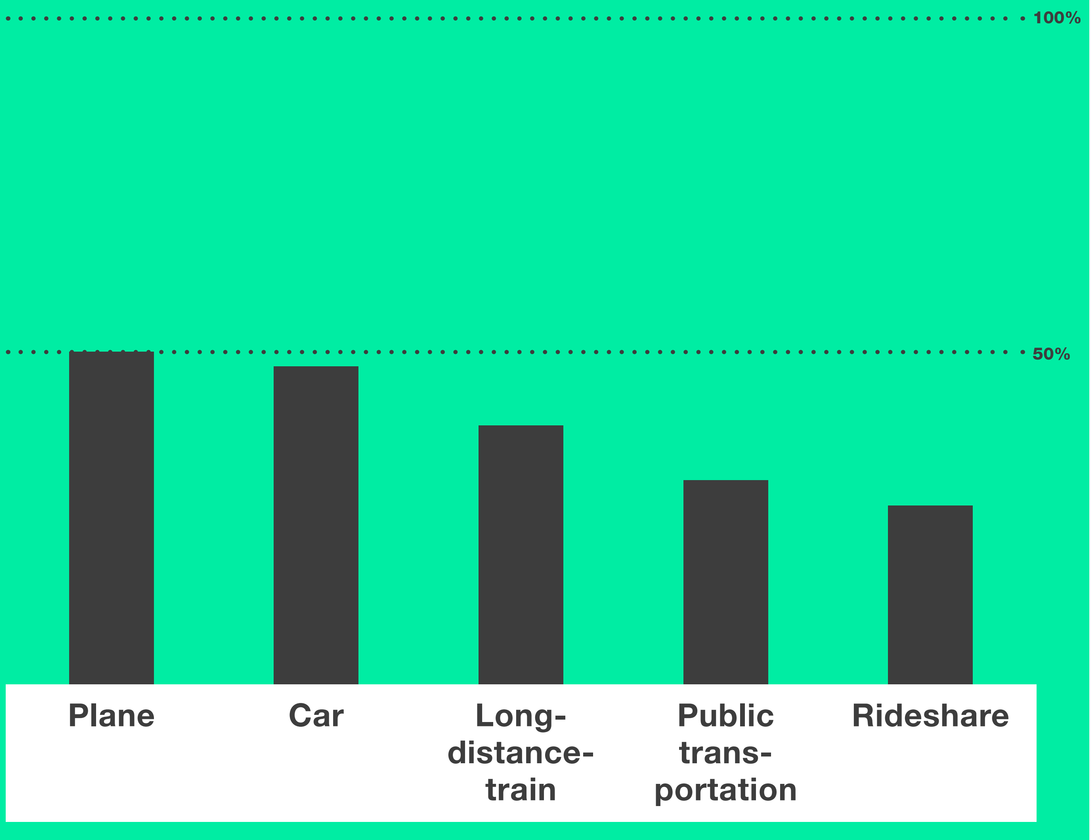
**Johann Friedrich Colsman**
Director General for Civil Aviation,
German Federal Ministry of
Transport and Digital Infrastructure

Many people are ready to travel by air again even if governments or international health agencies don’t give the all-clear. While the first edition of Oliver Wyman’s survey, carried out in May 2020, found that more than half of all respondents did not plan to travel until government restrictions were lifted or an official end to the pandemic was declared, by October that was down to less than one-third. This is in part because travellers trust the safety and cleaning protocols of their preferred airline, with roughly 60 percent of respondents saying that they viewed airline responses to the pandemic favourably.

# Most comfortable flying

**Safest transportation mode - “After the COVID-19 outbreak ends and travel restrictions are lifted, how comfortable will you feel doing each of these activities?”**

## Transportation modes

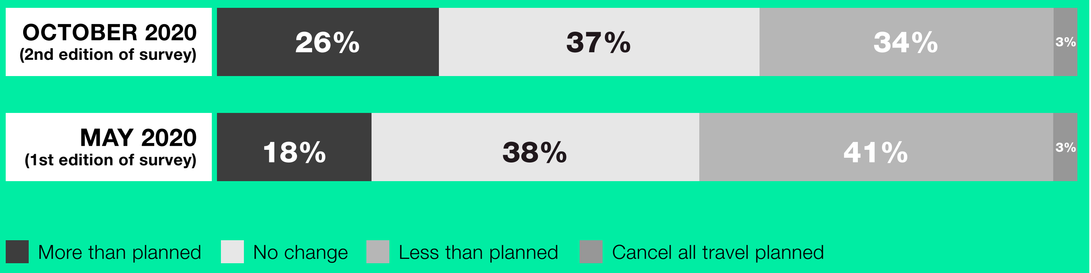


# Ready to fly again

## When the COVID-19 outbreak ends and travel restrictions are lifted, will you travel more, the same, or less than you had planned for leisure over the next 18 months?

**63%**

of travellers say they plan to travel the same or more for leisure once the pandemic is over.



## Could ‘COVID passports’ jumpstart the recovery?

Vaccinations are widely seen as the safest route back to unrestricted travel, but rather than waiting for the vaccine process to fully play out, something that will still take months at best, a number of governments and aviation industry players have begun looking at other ways to jumpstart international travel.

By the start of April, an option gaining traction was the utilisation of so-called ‘COVID passports’. The basic idea is that passengers who can produce digital proof that they’ve been inoculated will be able to travel without having to quarantine upon arrival.

As of April 2021, no country had announced that proof of vaccination against the coronavirus would be mandatory upon entry. But several initiatives were well underway. The European Commission, for example, was preparing to introduce a Digital Green Certificate to facilitate travel between European countries. Still being debated at the time of writing, the pass would provide

proof of vaccination and/or negative COVID test results.

Israel, the early leader in the global race to vaccinate, introduced a so-called ‘green pass’ app in February that allows access to cultural events. Although Israel’s certificate programme cannot be used for travel, it was the first large-scale test of how apps that prove vaccination will work. Other countries including Denmark, Estonia and Poland also plan to introduce some form of vaccine passport and the World Health Organization is also working on an electronic vaccination certificate that could be used for travel.

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**Johann Friedrich Colsman**
Director General for Civil Aviation,
German Federal Ministry of Transport
and Digital Infrastructure

With governments not yet on the same page, the fate of COVID passports may rest in the hands of the private sector and the aviation industry itself. But relying on airline employees and border officials to check and verify proof of vaccination or negative test results would be overwhelming and ineffective without the adoption of uniform standards, the International Air Transport Association (IATA) argues.

IATA has suggested that its Travel Pass app could be the solution for jumpstarting travel with a shared set of playing rules for the whole industry rather than a mix-match of individual national solutions. The Travel Pass app, which was scheduled to launch in mid-April, would serve as an all-in-one “digital platform for passengers”, containing relevant entry requirements, arrival testing locations as well as “the ability to share their tests and vaccination results in a verifiable, safe and privacy-protecting manner”.

Alexandre de Juniac, IATA’s Director General and CEO, argues that the Travel Pass is the best way forward after the “catastrophe” the industry faced in 2020, especially in light of the new COVID variations.

“The world is more locked down today than at virtually any point in the past 12 months and passengers face a bewildering array of rapidly changing and globally uncoordinated travel restrictions,” he said in February. “We urge governments to work with industry to develop the standards for vaccination, testing, and validation that will enable governments to have confidence that borders can reopen and international air travel can resume once the virus threat has been neutralized.”

Etihad Airways and Emirates began testing the Travel Pass in March and up to 40 other carriers are reportedly in talks with IATA about using it as well.

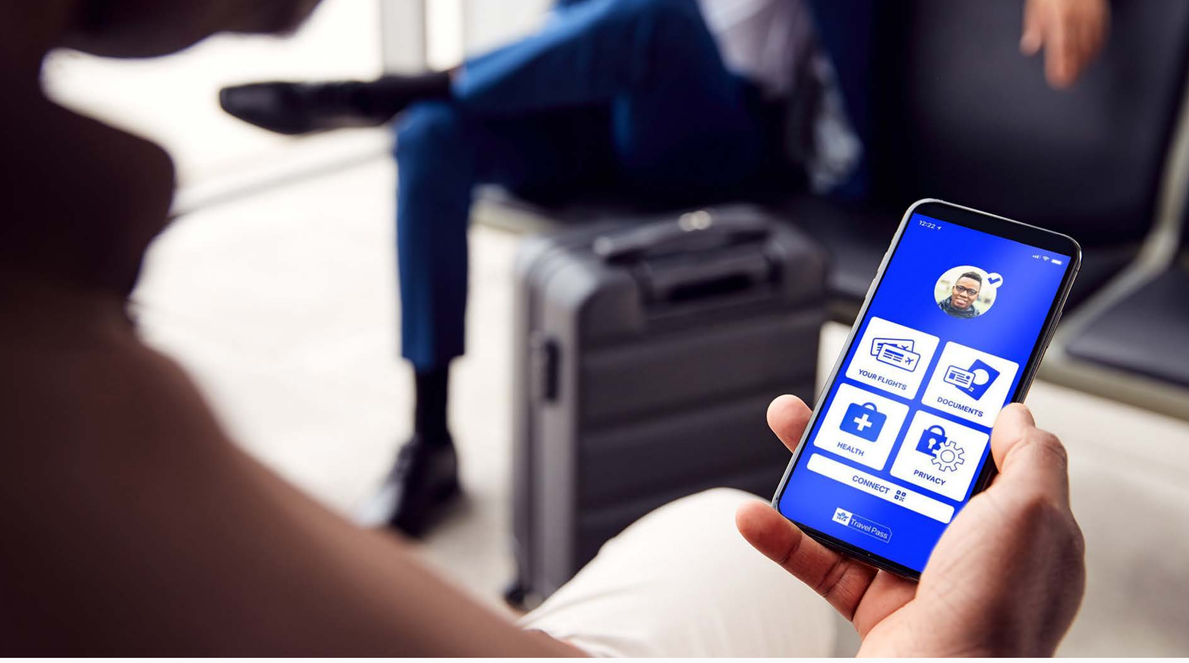
## Vaccination passes are no sure bet

While IATA represents 290 airlines that account for over 80 percent of total air traffic, at the time of writing there was no guarantee that its Travel Pass would get off the ground, let alone become the industry standard. In fact, it's not even a certainty that the industry will be able to agree on requiring proof of vaccination at all.

The first, and thus far only, airline to officially announce that it would require proof of COVID vaccination was Australian carrier Qantas, which plans to implement its vaccine requirement "between the middle-to-end of 2021".

Some airline executives have suggested that proof of vaccination will be necessary but have been less definitive in their statements, while others have expressed resistance.

Opponents of requiring proof of vaccination to travel argue that it would infringe on travellers' civil liberties. Industry players like the World Travel and Tourism Council (WTTC)




have argued that such policies would “take us to discrimination” while civil liberties groups have warned that vaccine passports “would create the backbone of an oppressive digital ID system” and could even “lead us to a techno dystopia”.

Ultimately, however, the aviation industry is unlikely to have to navigate these thorny issues, as it does not have any actual authority to require proof of vaccination.

“Governments, not airlines and not IATA, make the rules on entry requirements for travellers,” IATA wrote. “Governments will also decide if vaccinations will be mandatory or voluntary for their populations.”

# The Satair Takeaway

**“The desire to travel, to get on a plane and go somewhere far away, is still there. The big question is still around the COVID-19 vaccine. It’s a difficult metric to globally capture whether travellers feel safe. Countries have various government quarantine restrictions and regulations remain inconsistent, all of which impacts international travel.”**

**Paul Lochab**
Chief Commercial Officer
Satair

Chapter 2

# Parked forever?

**At the peak of the coronavirus crisis, airlines parked around 60 percent of the total global fleet. Never before has the industry seen so many of its aircraft temporarily put out of service.**

The global aircraft fleet stood at 24,500 at the end of 2020. Although that represents a major rebound from a low point of just roughly 8,000 aircraft in service in April 2020, it's still an 18 percent drop from the previous year.

Having so many aircraft temporarily out of service puts the maintenance, repair and operations (MRO) industry in uncharted territory.

# Parked Fleet

**At the peak of the crisis, roughly two-thirds of all mainline aircraft worldwide were grounded. The total aircraft fleet stood at 24,500 at year's end, an 18 percent drop from 2019.**

# Maintenance challenges

Grounded aircraft may experience less wear and tear than when they are in service, but they're not just parked somewhere and forgotten until they're needed again. Most aircraft are parked in "flight-ready" condition and because airlines' post-pandemic plans are still uncertain, many have opted to keep their parked aircraft on active maintenance schedules rather than relegating them to so-called "deep storage".

Before parking the aircraft, even if it's just for a few days, there's a detailed process that includes covering intakes and exhaust points, protecting internal entertainment systems, greasing and cleaning landing gear, turning off cockpit controls and disconnecting batteries. Most parked aircraft are then put on a service schedule that requires basic visual inspections every seven days, electrical and brake maintenance every

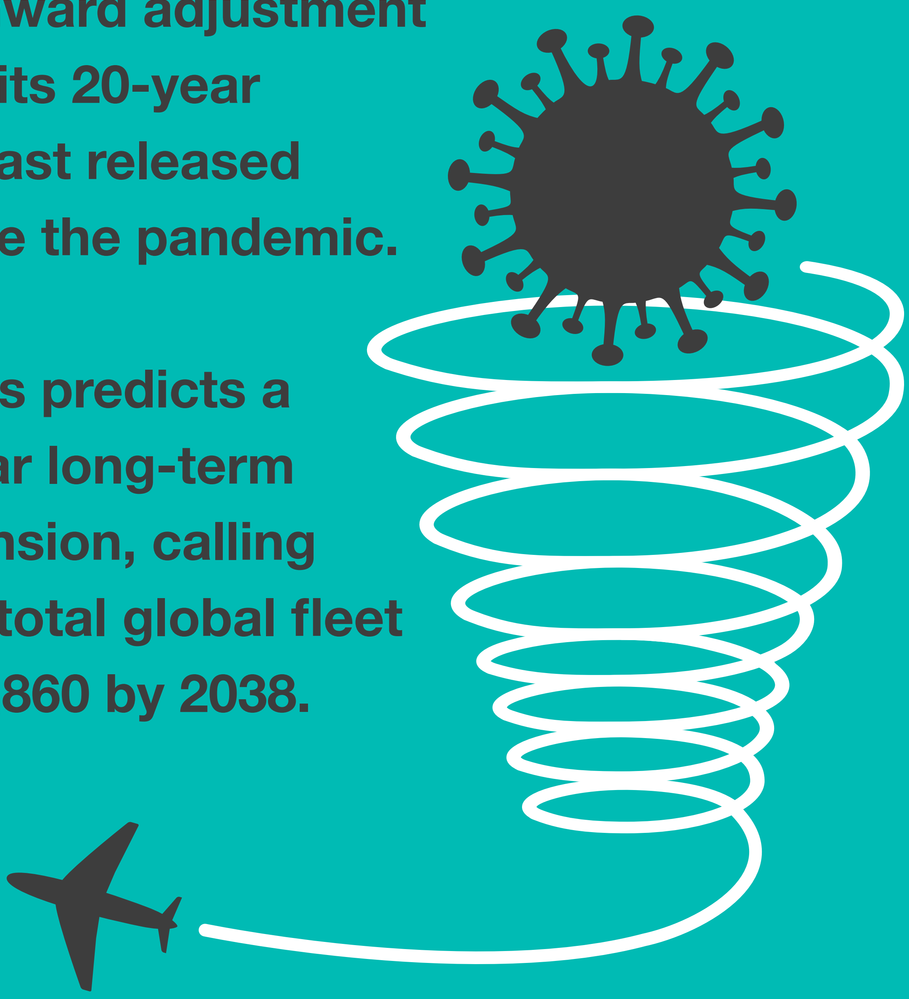
14 days and fuller checks, including starting the engine and inspecting anti-ice systems, every 30 days.

According to an October study published in the Journal of Air Transport Management, periodic maintenance intervention will go down the longer an aircraft is parked. But with airlines leery of consigning aircraft to deep storage, which typically entails draining oil and fuel from the engines, some parked aircraft end up in a grey zone in which they get less maintenance than they normally would but aren’t formally abandoned. Much of what happens next is educated guesswork since most maintenance manuals include plans for long-term storage but don’t offer detailed instructions for how to prepare aircraft for extended periods of being out of service.

# Long-term recovery

**The global fleet is not expected to return to its pre-COVID fleet numbers until the end of 2022 at the earliest, but long-term forecasts are still bullish. In its 2020 Market Outlook released in October, Boeing expected the global fleet to reach 48,400 by 2039, only a four percent downward adjustment from its 20-year forecast released before the pandemic.**

**Airbus predicts a similar long-term expansion, calling for a total global fleet of 44,860 by 2038.**



The fact of that matter is that some of the aircraft parked in 2020 are likely to remain out of service permanently. The international consultancy Oliver Wyman predicted that more than 2,600 planes will be retired by the end of May 2021, a roughly five-fold increase over the number of aircraft retirements in a typical year. These accelerated retirements are likely to cause ripple effects throughout the MRO and aftermarket sectors, which we'll explore in the following chapter.

But there may also be an upside. Around 2,000 of the aircraft likely to be retired early as a result of the COVID-19 slowdown are at least 20 years old. Replacing these outdated planes with newer models will ultimately prove to be a boost to the aviation industry's growing green ambitions.

# Aircraft retirements

**More than 2,600 planes will be retired by the end of May 2021, a roughly five-fold increase over the number of aircraft retirements in a typical year.**

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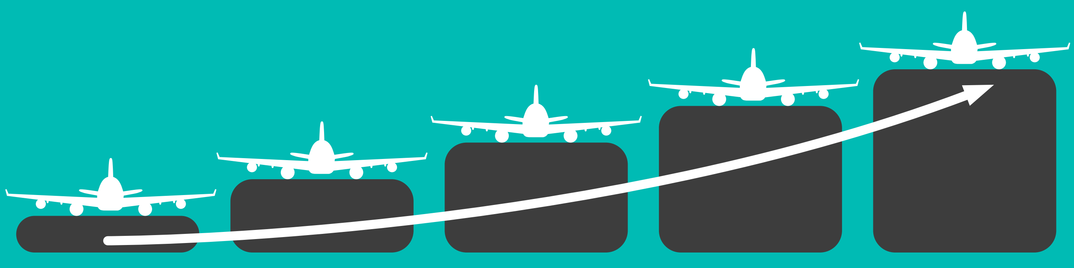

# A silver (and green) lining

Newer aircraft are lighter and more fuel-efficient than older models. Bringing these new models into service earlier than expected will help the industry improve upon a long-term trend that has already cut billions of tonnes of CO2 since 1990. As we'll discuss further in Chapter 4, it's vital that the aviation industry not allow the coronavirus pandemic to derail its long-term sustainability goals.

If airline operators view the COVID-19 crisis as an opportunity to fast-track the conversion of their fleets from older models to newer ones, the next generation of aircraft won't just be greener. They'll also be more technological and more connected than their predecessors. But with the replacement timeline now compressed because of the industry downturn, the MRO industry will have less time to adapt to the new models.

# Long-term fleet growth

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In its 2020 Market Outlook released in October, Boeing expected the global fleet to reach 48,400 by 2039, only a four percent downward adjustment from its pre-pandemic 20-year forecast. Airbus predicts a similar long-term expansion, calling for a total global fleet of 44,860 by 2038.

But these long-term fleet estimates, like so much else related to the future of the industry, will depend on the course of the current recovery.

# The Satair Takeaway

**“The fleet size will be reduced considerably due to passenger load factors, airlines will reduce capacity to right size the fleet. Many of the older wide-bodies are parked and others are being converted to cargo, while some aircraft won’t come back at all. I think aircraft twelve years and older are going to be replaced by newer, more efficient and environmentally-friendly models.”**

**Paul Lochab**
Chief Commercial Officer
Satair

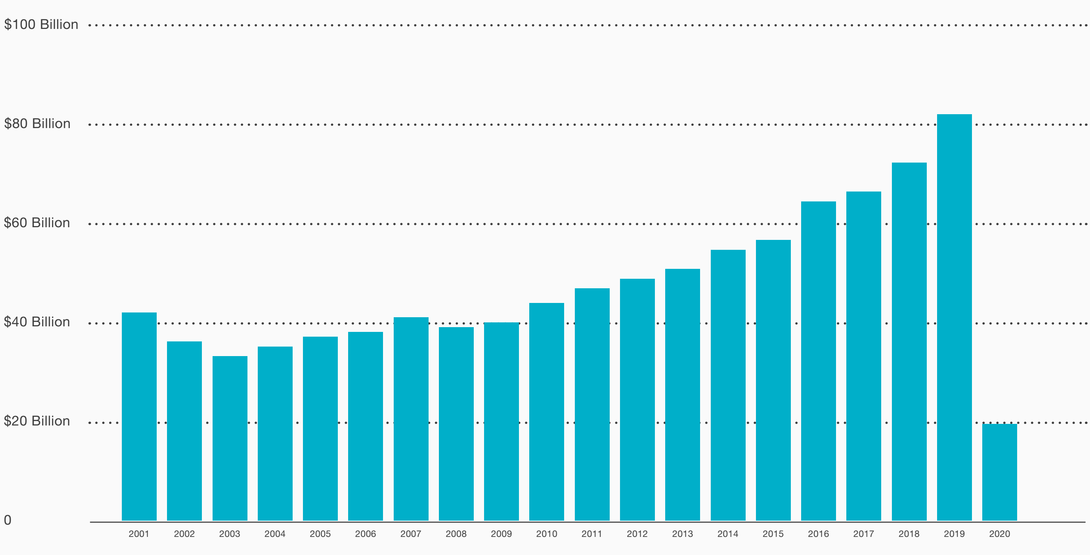
Chapter 3

# Spending down, maintenance delayed

**Airlines have been forced to find ways to cut costs to ride out the crisis. Unfortunately for the MRO industry, many of those cost-cutting measures came from cancelling aircraft orders and putting off maintenance and repairs.**

# Global commercial aviation MRO spend

## Maintenance, repair and overhaul spending in 2020 fell to lowest levels in two decades



# Orders and spending down

The pandemic and its corresponding travel restrictions and economic recession cost airlines billions of dollars in losses in 2020, forcing them to limit their rate of cash burn and look for ways to tighten their collective belts. In many cases, that meant putting off plans to fill new aircraft orders, or in some cases scrapping fleet expansion plans altogether.

The two leading aircraft manufacturers both experienced large drop-offs in their deliveries in 2020. Boeing delivered just 157 aircraft, a 58 percent decline from the 380 it delivered in 2019, while Airbus saw its deliveries fall by 34 percent, going from 863 in 2019 to 566 last year.

The crisis also forced airlines to cut back on spending and put off maintenance whenever possible. According to consultancy firm

Roland Berger, the MRO market contracted by upwards of 60 percent in 2020.

The drop in MRO spending is especially pronounced in the sector's biggest and most expensive segment: engines and airframes. The International Bureau of Aviation predicts that the demand for engine work will "collapse" over the next two to three years, while Roland Berger also expects the engine maintenance to "be hit hard" in the short term as airlines look to maximize the flight hours of their current engines and to "suffer strongly" in the long term as a result of accelerated aircraft retirements.

The situation looks even worse for the airframe maintenance segment, which is expected to "be hit exceptionally hard" as airlines replace aircraft and "try to postpone heavy checks by optimizing useful life across the fleet."

Because aircraft require more maintenance as they age and later-life upkeep projects are typically more expensive than early-cycle maintenance, the accelerated shift to an updated fleet that we discussed in the previous chapter is likely to have a long-lasting impact on MRO spending. Having fewer older aircraft to work on will be part of the reason MRO spending is expected to decline by $30 billion over the next decade.

# A changing aftermarket landscape

The retirement of older aircraft will also cause significant changes in the used serviceable materials (USM) landscape. The Oliver Wyman report estimated spending on all aircraft parts, both new and used, to be just $26bn in 2020, less than half of its original forecast of $60bn. USM spending is expected to account for 11 percent of the overall parts and materials market, compared to nine percent last year, as the cash-strapped industry looks for ways to lower costs.

There are also concerns that stripping parts from retired aircraft will create a glut in the market. Oliver Wyman warns that “this cannibalization will create a substantial ripple effect throughout aviation’s supply chain and will make it critical for MRO providers to ensure reliable sources of parts”.

The MROs that can position themselves as reliable distributors to third party vendors or dependable direct sources of USM parts, which can be 60-80 percent of the price of a new part, will be setting themselves up for future success once air travel begins to bounce back to pre-pandemic levels. But that's a long haul, with most industry experts not expecting a return to pre-COVID levels until 2023 or 2024.

As we reported in our 8 Big Aviation Aftermarket Trends for 2020, OEMs and the big airframers like Airbus and Boeing are increasingly entering the aftermarket. While this trend offers clear opportunities for airlines, it also presents challenges for smaller parts providers who have a hard time matching the resources and technologies of the larger OEMs. With USM demand and prices currently low as a result of the industry's COVID troubles, Oliver Wyman predicts that the larger market players may see this as an opportunity to buy up supplies.

# Some MROs won’t make it

The uncertainty surrounding airlines’ parked fleets and the projected drops in new orders and maintenance pose serious dangers for MRO providers. The parked fleets could end up having a devastating impact on independent MROs, as airlines may decide to bring the basic maintenance processes in-house in another cost-cutting move. And the longer aircraft remain grounded, the higher the chances that some airlines will not survive the crisis. If and when airlines go bankrupt, MROs and other dependent companies are likely to follow.

Given the overall state of the aviation industry, it’s perhaps surprising that 2020 didn’t see more bankruptcies. That’s not to say that there weren’t some casualties, however. COVID ultimately proved too much for a handful of regional operators, such as Cathay Dragon, Level Europe, Compass Air,

ExpressJet Airlines and Montenegro Airlines. The difficulty in making it through the worst period in industry history was succinctly summed up by IATA it in its year-end report: “A number of airlines have substantial cash reserves to survive until revenues rise strongly late next year. But many airlines do not.”

If the pandemic keeps air connectivity severely limited throughout 2021 and beyond, the struggle for airlines – and the MRO providers that service – to survive will become more and more difficult.

> “
> **For the smaller MRO providers [...] the COVID-related falloff in demand and recession may prove existential threats to their operations.**
> ”

# The Satair Takeaway

**“The narrow-body aircraft and demand on engine maintenance will keep the engine OEMs and MROs busy, though capacity is still pretty tight. Regarding component repair, I’m not too worried, there are plenty of OEMs and MROs that can manage repairs. Maintenance constraints will be material availability, as everyone will have to reduce inventory and increase lead times. Airframe MROs, meanwhile, continue to work with increased demand from lease returns and maintenance checks.”**

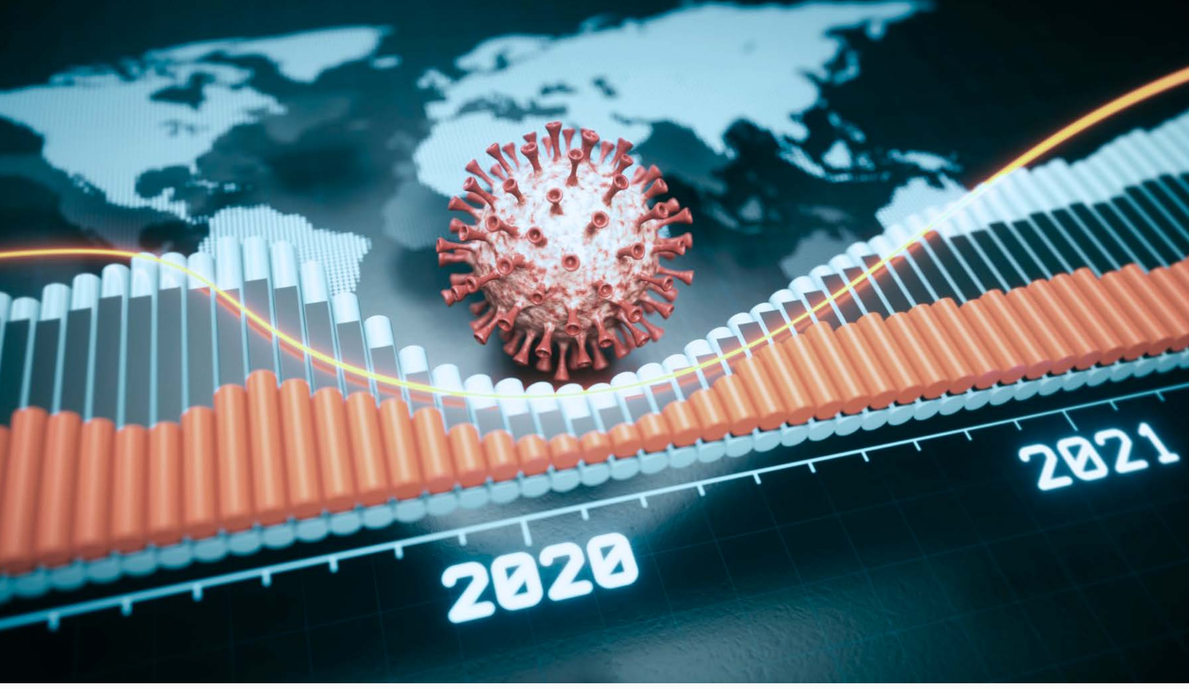
**Paul Lochab**

Chief Commercial Officer

Satair

Chapter 4

# Another challenge looms




**The pandemic overshadowed nearly everything else in 2020. But the aviation industry cannot afford to let its fight for immediate survival affect its long-term sustainability goals because another crisis looms.**

**More accurately, a long-standing crisis that was pushed out of headlines and our collective consciousness by the worst global health threat in a century hasn’t gone away. In fact, it got worse.**

**We’re talking, of course, about the climate crisis.**

# Part of the problem, part of the solution

Despite the short-lived environmental benefits of global lockdowns, 2020 ended in a statistical tie as the hottest year in history. It's another grim reminder of how complicated  climate change is and how difficult it will be to address. There are various causes of climate change, but it is undeniable that the aviation industry contributes to the problem. Thus, there is a collective responsibility to also work toward solutions.

Aviation accounts for roughly 2.5 percent of humanity's global CO2 emissions. As the industry enjoyed a prolonged period of growth prior to the coronavirus pandemic, it also saw its collective carbon footprint steadily expand. According to Our World in Data, aviation emissions have doubled since the 1980s and have grown by an average of

four to five percent per year since 2010. By 2018, global passenger and freight aviation had surpassed one billion tonnes of annual carbon emissions.

The impact of COVID-19 resulted in a 60 percent drop in aviation emissions at the peak of the crisis, although this was the natural result of steep drops in travel rather than the result of ‘green’ industry initiatives.

## Green recovery

The industry is well aware of its environmental impact and has shown in recent years that it is ready to take meaningful steps to address the issue. Back in 2009, the sector committed to a long-term goal of cutting CO2 emissions in half by 2050. An important stepping stone along the way of hitting that target was the agreement that the industry would achieve

carbon-neutral growth by 2020, meaning that aviation's carbon emissions would stop increasing even as air travel increases.

That mid-term goal was aided by the COVID downturn, but to hit its lofty long-term target the industry needs to factor its green ambitions into the COVID recovery.

"Manufacturers invest billions of dollars a year to make the next generation of airplanes even more fuel efficient, but disruption from COVID-19 will make it difficult to maintain this level of investment in research and development," Eric Fanning, chair of the International Coordinating Council of Aerospace Industries Associations, warned in September. "Moving forward, government and industry leaders must find new ways to collaborate on funding and developing innovative technologies that will address climate change."

The big airframers Airbus and Boeing have long been on the same page when it comes to sustainability. The fierce competition between the two companies have spurred technological advances that have made aviation more efficient and they have often joined forces to push the industry in a greener direction, particularly when it comes to the development of aviation biofuels.

Despite the difficulties the companies faced in 2020, as detailed in the previous chapter, Airbus and Boeing have both recently announced ambitious plans to continue their green transitions. In January 2021, Boeing committed to producing commercial airplanes that are capable and certified to fly on 100 percent sustainable aviation fuels by 2030.

“Our industry and customers are committed to addressing climate change, and sustainable aviation fuels are the safest and most measurable solution to reduce aviation carbon emissions in the coming decades,” Boeing Commercial Airplanes President and CEO Stan Deal said.

For its part, Airbus is moving forward with what it’s called a “hydrogen revolution”, making R&D investments and committing to collaborate with other industry players as it moves toward its goal of developing a zero-emissions aircraft by 2035.

“At Airbus, we strongly believe renewable energy needs to power future aviation. And hydrogen is potentially the best pathway through which to do so,” Airbus VP of Zero-Emission Aircraft Glenn Llewellyn said.

# COVID's impact

It's arguably too early to say with any authority what the coronavirus crisis will mean for the industry's green goals. On the plus side, the pandemic-induced downturn may have actually sped up existing plans to convert to more sustainable aircraft, as we discussed in Chapter 2. Many airlines saw the 2020 slowdown as an opportune time to convert to newer, lighter and more efficient aircraft models. Retiring older models can help accelerate the industry's push toward sustainable aviation.

With less air travel in 2020 and fewer flights than normal expected over the next couple of years, the industry's CO2 emissions are naturally going to fall in the short-term and may result in a forced recalculation of the sector's long-term environmental impact and goals.

On the down side, airlines' revenue losses have left them with less money to invest in efficiencies and the types of innovative technologies that will be needed to reach the goal of sustainable air travel. In short, one of the cumulative effects of COVID may be that it takes the industry longer to truly go green.

## ↘ Status report

That's not to say there aren't plenty of innovative technologies well underway. The ongoing shift to an updated global fleet has already helped the industry save billions of tonnes of CO2 over the past three decades. Between 2009 and 2020, innovations in aircraft design, engine technology and air traffic management improved fuel efficiency by an average of 2.1 percent per year.

> “Air transport is in the midst of the deepest shock in its history. However, as we plan for the recovery of air connectivity, we also must prioritise our environmental progress.”

**Michael Gill**
Executive Director,
Air Transport Action Group

The transition from fossil fuels to Sustainable Aviation Fuel (SAF) – biofuels made from plants, algae, or waste products – has been described as a “game-changer” for its ability to reduce life-cycle emissions by as much as 80 percent. SAF has already been blended in with regular jet fuel on hundreds of thousands of flights, but on the whole it accounts for just 0.1 percent of aviation fuel. By IATA’s estimate, this could reach two percent by 2025 and then expand quickly from there.

SAF is only one part of the industry's larger sustainability plan, which was laid out in detail in September's Waypoint 2050 report spearheaded by the Air Transport Action Group. In addition to endorsing the wider adoption of SAF and new technologies like electric and hydrogen aircraft and new airframe designs, the action plan also calls for infrastructure improvements on the ground, more efficient flight operations and carbon offsets.

The industry's plan to implement the latter began in earnest on January 1, 2021. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) was designed to use carbon offsets to help the industry hit its carbon-neutral growth target by stabilising net emissions at around 600 million tonnes. Nearly 100 countries are involved in CORSIA's pilot scheme and many others are expected to join by 2027. CORSIA is not without controversy, however, as many critics pan it as a green light for airlines to pollute more.

While SAF and CORSIA are in use now, there are other exciting developments expected further down the road. One of the

three concepts for Airbus's hydrogen-powered aircraft ZEROe is a blended-wing body model that represents a significant departure from aircraft design as we know it. A similarly radical makeover of the traditional aircraft is the Flying-V being developed by TU Delft and KLM. This aerodynamic long-distance plane would use 20 percent less fuel than the Airbus A350, which itself is 25 more fuel efficient than other aircraft types in its class.

## All-of-the-above approach

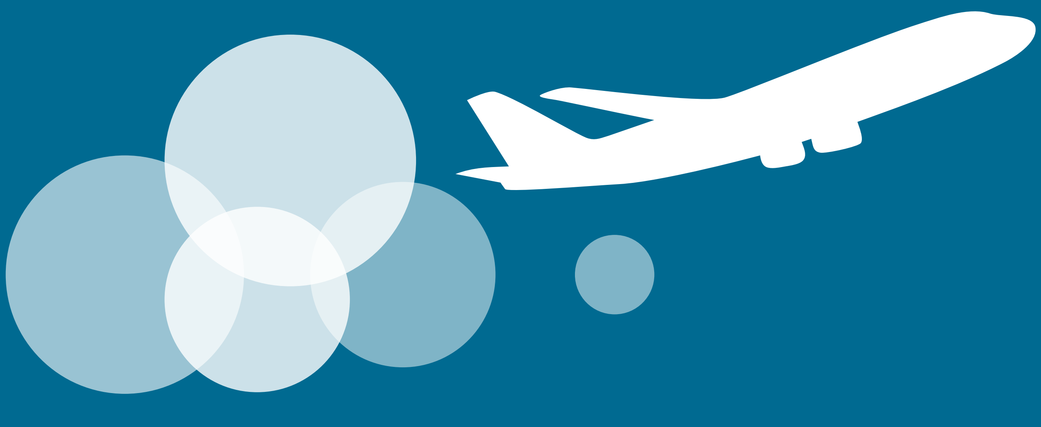
Whether it's designing the aerodynamic, fuel-efficient models of the future, increasing the use of SAF, or merely moving away from outdated aircraft, the industry needs an all-of-the-above approach if it's to achieve its sustainability goals.

The COVID crisis provides a unique opportunity for a green reset, also when it comes to public opinion.

The small but growing anti-flying movement of recent years has changed the way many people view air travel. After a year in which air travel was essentially shut down, there's bound to be a pent-up demand for travel as people desperately want to reunite with dearly missed family and friends. This might mean that the *flygskam* (flight shaming) movement gets pushed aside momentarily, but it's a safe bet that it will return.

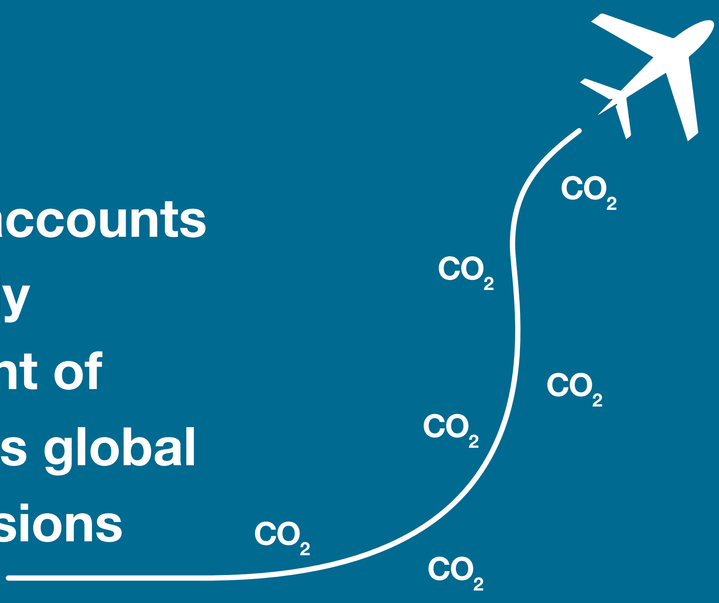
Viewing the current downturn as an opportunity to double down on, rather than abandon, sustainability improvements could go a long way to both achieving the industry's 2050 climate goals and swaying public opinion.

**Aviation emissions have doubled since the 1980s**

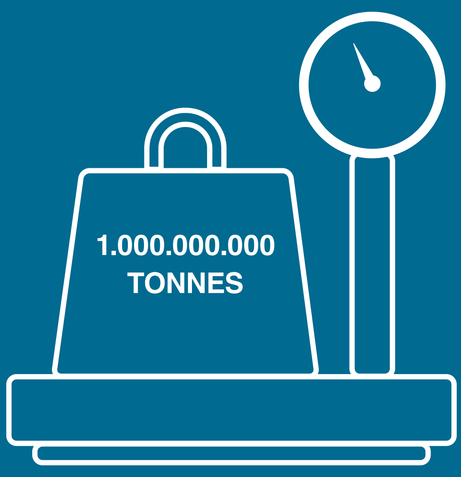


# Fact

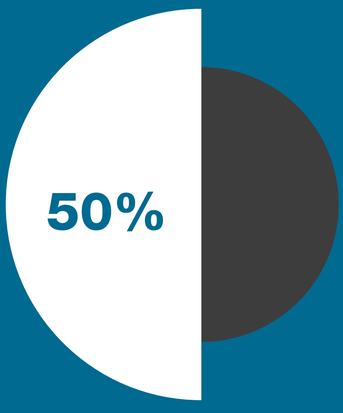
**Aviation accounts for roughly 2.5 percent of humanity's global $CO_2$ emissions**




**One billion tonnes: Total global passenger and freight aviation**




**2050 goal: Cut aviation emissions by 50%**



# The Satair Takeaway

**“By 2030, this industry will have totally changed. We will definitely hit the emissions cuts targets but long before that we’ll see new technology aircraft (hybrid electric and hydrogen powered).**

**If you look at where we were in the 1960s compared to today, there has been an enormous amount of innovation. I see the industry constantly changing along with new technological advances in coming years.”**

**Paul Lochab**

Chief Commercial Officer

Satair

Chapter 5

# New changes and old problems


**After the worst year in aviation industry history, there are no shortage of problems both old and new. Will 2020 go down as the turning point toward a more successful and agile future?**

As the old saying goes, the night is always darkest before the dawn. For the aviation industry, the situation has never been darker than it was in 2020. But a bright future is still on the horizon if the industry can successfully meet the historic challenges it faces.

# Innovation motivation?

Aviation is one of the most advanced, high-tech industries in the world. It's arguably also quite conservative and slow to embrace change. This can in part be explained by aviation's focus on safety. With millions of passengers relying on airlines to deliver them safely to their destinations each year, it's both understandable and prudent that new technologies and procedures aren't introduced on a whim.

But a prolonged period of steady year-on-year growth has likely also fed into this conservative mindset. Now that the so-called golden age of aviation has come to a screeching halt, is it time for the industry to be more open to change? The evidence suggests so.

Reactions to the COVID crisis have gone beyond the safety responses we touched on in Chapter 1. Airlines were forced to adopt shorter and more flexible scheduling windows as border closures and flight cancellations wreaked havoc on long-term planning. Airlines traditionally built their schedules six to twelve months in advance, but these scheduling windows were shortened to as little as six during the pandemic. This more dynamic approach to scheduling was identified by global aviation data firm Cirium as one of the most important trends to watch in 2021.

From the public's perspective, the most interesting – and tempting – industry reaction will be efforts to win back customers. Several airlines have announced plans to extend elite status and mileage accruement programmes despite drops in travel in an effort to keep frequent flyers in the fold. General pricing decisions, however, will have an even greater impact.

Once travel restrictions are fully lifted, airlines may still have trouble filling flights. One obvious way to lure travellers back to the skies is to offer deep discounts to spur demand. The flight alert subscription

service Dollar Flight Club reported that domestic flights in the United States were 41 percent lower than average in 2020, and that ticket prices for international flights from the US had fallen 35 percent. While expert opinion early in the pandemic suggested that flights would become much more expensive, consumer-facing groups are now predicting even steeper price drops in the future.

Pricing decisions will thus be one of the most important factors in the industry's recovery.

## Data and digitisation

Airlines are expected to increasingly rely on new data approaches to guide not only pricing decisions but also their future plans for routes and capacity. The consulting firm McKinsey went so far as to suggest that so much changed in 2020 that pre-crisis data will be "unlikely to accurately forecast demand" for customer preferences and inventory decisions.

The industry's need to convert analogue processes to digital ones and to better leverage data and new technologies has long been known. And while it's true that the use of new technologies like blockchain solutions and predictive maintenance has expanded in recent years, the adoption of these advances has not been uniform. With so much of 2020 consumed by the mere fight for survival, there is a risk that the gap between the industry's digital pioneers and those still clinging to processes and technologies that are decades old has widened.

Those slow to adapt risk being irretrievably left behind as the market for data analysis, predictive analytics and digitalisation processes within the aviation industry, which has already seen explosive growth, continues to expand and offer new opportunities.

Boeing's ten-year market outlook, released in October, identified digital solutions as a "critical enabler" of a $3 trillion market opportunity through 2029 for those customers that are able to leverage these solutions to create leaner and more efficient operations.

# A more touchless experience

One of the more obvious technological solutions to COVID is expanding digital and touchless services that minimize human contact, encourage social distancing, and in some cases take humans out of the equation altogether.

Many of the exciting developments on these fronts are emerging in airports. A number of airports have responded to the health challenges of the pandemic by making pre-flight processes more automated. Touchless technology at ticket lobbies, gate lounges and baggage claim areas are allowing passengers to maintain their distance while taking care of departure and arrival necessities.

Some airlines have introduced biometric photo-matching technology to limit face-to-face interactions and speed up the check-in process. Airports have introduced facial recognition and advanced body scanners that allow passengers to quickly move through security checks without stopping, minimizing their exposure to fellow travellers and airport staff. Others have rolled out apps to schedule security screening times to limit congestion

Touchless solutions have even been implemented that allow passengers to buy snacks and concessions with little or no human contact or use special apps to order food from terminal restaurants and have it delivered to drop-off areas.

## New physical changes

Possible physical changes at airports include passenger wellness screening, on-site medical clinics and dedicated quarantine areas. The physical layout of waiting areas

could also change to support social distancing, as could the seat assignments allocated by airlines.

Both at the airport and on board, passengers are increasingly likely to see advanced cleaning technology in action, in the form of self-driving robots that use ultraviolet light to disinfect floors and surfaces and full-body sanitizing machines.

## Old problems

Technology cannot fix all of the industry's problems, however. In light of 2020's steep spending decreases and the projected future drop in demand, many airlines and MRO providers have had to cut jobs or even shut down altogether. According to the Waypoint 2050 report, 1.3 million airline jobs were lost in 2020. On top of that were the losses of 220,000 airport operator jobs and 151,000 civil aerospace jobs. Another 3.2 million people who work on-site at

airports are also out of work, showing the domino effect of the aviation sector's woes. The IATA estimates that the global airline industry will see only a modest five percent employment increase throughout 2021.

These job losses compound the already-existing concerns about a long-term labour crisis within the aviation industry. It's estimated that roughly 27,000 new pilots will be needed by the end of this year and more than 260,000 will be needed over the coming decade.

Within the MRO sector, a dwindling labour supply is the result of an ageing workforce and fewer young and trained aviation maintenance technicians (AMTs) ready to take their place within the job market.

Market forecasts released by Boeing and Airbus in 2018 predicted that the MRO industry will need at least 600,000 new technicians by the year 2037. The industry has found it hard to attract young talent, in large part because wages and benefits fall short of their expectations. Industry wages are predicted to decline as a result of COVID-19, so this long-term challenge is unlikely to be solved soon.

# The Satair Takeaway

**“A problem with the airline industry is the hesitancy. If one of the major carriers does something, the others will follow but there’s a hesitancy to go first, unless it is driven by new low-cost carriers.**

**New emerging technologies (robotics, AI, and IoT) will play a big role in manufacturing and maintenance. I think there will be a shift to unmanned systems, remotely-flown aircraft and alternative fuels.”**

**Paul Lochab**

Chief Commercial Officer

Satair

Conclusion

# Worst year ever. Now what?

# Looking beyond recovery

Neither the coronavirus pandemic nor the aviation industry's problems are likely to end in 2021. But both will improve. At the time of writing, vaccinations were picking up steam and the light at the end of our collective long dark tunnel was emerging.

On the aviation front, the worst of the crisis has passed, people want to travel again and the industry has shown that it's willing to go to great lengths to ensure that flying is safe, responsible and appealing.

The industry has faced serious crises before and each time, whether it was 9/11, the SARS and Ebola outbreaks or the Great Recession, it has recovered. But what happened in 2020 was akin to adding together the effects of all recent industry shocks into one calamitous event.

Most experts agree that the industry will recover, but how and when are still open questions. On the latter, we're likely in for a long haul. Pre-COVID numbers are not expected to return until 2024 even under the most optimistic scenarios. There are even suggestions that the long tail of the coronavirus crisis might still be felt for decades, with the Waypoint 2050 report predicting that air traffic in 2050 will be 16 percent lower than it would have been in a world with no COVID-19.

The industry cannot control the course of this pandemic nor stop a future one, but it can control how it responds. Decisions made now will determine whether aviation can emerge stronger, greener and more agile.

# Discover More

Our Knowledge Hub is filled with many more insights and expertise on the topics that were covered in this eBook. Visit blog.satair.com to learn more and discover something new.

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