Meeting the unprecedented, complex challenges posed by the coronavirus will trigger the industry’s innovation gene – resulting in better air travel for everyone.
For an industry that went from wood-and-fabric biplanes to space flight in less than a generation, continuous improvement and innovation is a way of life. Constant re-invention and refinement of equipment, facilities, tools and practices is standard operating procedure. It happens every day.

So when the air travel industry meets an obstacle or some opposing force, it tends to lead with its strength and innovate its way out of the situation.

Without question, the novel coronavirus pandemic is an opposing force. The lockdowns, reduced flight schedules, dismal passenger demand, new health and safety requirements, plummeting revenues, employee layoffs and a whole host of associated difficulties have been a tsunami-sized disruptor.

And it’s not over. Worldwide, air passenger volume is not expected to fully recover to 2019 levels until at least 2024, according to a recent report by the International Air Transport Association.¹

But stepping back just a bit reveals opportunities. True to form, the air travel industry is coming together and innovating its way through. And not only that, it’s accelerating changes that will make the entire air transportation infrastructure significantly better – for passengers, airlines and airports. In short, the pandemic has turbo-charged the industry’s innovation gene.

Collins Aerospace is an integral part of that DNA, providing the services and technology solutions that fuel forward progress. In the following paper, Collins explores the many ways airports and airlines can take full advantage of new ideas and technologies – some in development, some under consideration – that will not only reduce or eliminate pandemic-related concerns, they will also enhance just about every aspect of air travel. The message is simple. By taking full advantage of new ideas, technologies and practices that address pandemic-related concerns, the industry can simultaneously and with the same resources vastly improve air travel overall.
It all begins with the passenger. When passengers are afraid to fly – for whatever reason – they don’t. Immediately after the terrorist attacks of 9/11, more than 40 percent of Americans said they were less willing to fly and passenger traffic remained far below the prior levels for some time.2 Airports and airlines addressed this fear by adding a massive security infrastructure, including armed military patrols, more thorough screening of people and bags, air marshals and multiple ID checks for every passenger. This increased security eventually made passengers feel safe enough to return to the skies in record numbers.

Restoring passenger confidence as the novel coronavirus lingers on will require a similarly strong response by the industry.

What passengers want

A recent survey commissioned by Collins found that passengers have three primary requests of airports and airlines in the age of COVID – to feel safe, stay informed and minimize interactions.

Passengers want a low-contact, end-to-end continuum of care that allows them to manage their own journey in a way that feels safe. To meet these expectations, airports and airlines must give passengers more control over their travel experience from the moment they book a flight to the moment they arrive at their destination – a curb-to-curb solution. The key to this control is not some new invention. In fact, most people carry one around all day: the ubiquitous mobile device.

By taking full advantage of the mobile phone technology that passengers are already familiar with and accustomed to using, airports and airlines can put the power of tailored travel into the hands of each passenger, quite literally.

While some airlines already provide apps for booking, flight notifications, check-in and boarding, apps could be expanded to assist with just about every action a passenger might take before, during and after the flight.
A passenger’s scenario

Passenger X decides to travel from New York City to Paris. As she books her flight, she confirms her identity with the airline by uploading a photo of herself along with her passport. Through Collins SelfPass™ biometric identity management system, this imagery is compared to existing images in secure government databases and verified. Verification enables both the airport and airline to know exactly who she is throughout her journey.

When Passenger X arrives at the airport, she walks to a SelfPass check-in kiosk where she is immediately identified through a biometric facial scan. The kiosk has the option of a touch-screen interface, but Passenger X opts to use her mobile device instead. A simple scan of a bar code on the self-service kiosk with her mobile phone camera gives her a wifi connection to the device and she is able to complete the check in process without touching anything but her own phone. Her check in process may include a rapid health screening of her temperature and other key physiological biomarkers, such as respiratory rate, from sensors built into the biometric camera. She screens as “normal,” so she is cleared to proceed.

She then moves to the self-service baggage station to check her bags, again using her biometric identity that allows her to drop her luggage on the belt and move ahead. With bags checked, she proceeds to Security. She receives a text notification indicating the time she will go through the security process. There are no lines, just an area where people are seated – socially distanced – as they wait for their appointments.

When her phone notifies her that her appointment time has arrived, she moves quickly through Security. No need to pull out her passport or other documents – her SelfPass ID is the only identification she needs.

Next stop, the duty-free shop. Passenger X wants to pick up some gifts for her friends in Paris. After collecting several items, she simply walks up to a SelfPass camera linked to a point of sale device and exits the shop. No need to stop at a cashier station or dig through her purse for a credit card or cash. The credit card tied to her SelfPass ID automatically covers her purchases.

After that, she moves on to the airline lounge. Again using her biometric single token identification, she gains access and orders a pre-flight snack. As she waits inside the lounge, the app tracks her flight and reminds her through text notifications when it’s time to go to the gate.

As a SelfPass flyer, Passenger X is able to use the special self-service boarding gate. There is no need to show documents, interact with an attendant or even pull out her phone. A quick facial scan confirms her identity and allows her to pass through the gate.

Today and looking forward, Passenger X will be able to manage every touchpoint of her journey through her mobile device and a secure single-token biometric identification, making the entire experience more seamless, more personalized and virtually contact-free.
Airlines: Cleaner cabins, safer crews

While the airlines have become masters at cleaning and disinfecting aircraft interiors to prevent the spread of the virus, the time, effort and costs are substantial. As a leading provider of aircraft interiors, Collins is developing ways to reduce this burden and take cleaning to a whole new level. How? By building more hygienic features directly into the aircraft.

For instance, Collins’ cabin air recirculation High-Efficiency Particulate Air (HEPA) filters can capture almost 100 percent of ultrafine airborne particles that have a diameter of 0.01 microns or 10 nanometers, according to a recent NASA study. The virus that causes COVID-19 has a diameter of approximately 0.125 microns or 125 nanometers. While Collins already equips most commercial passenger aircraft with these filters, the company can also retrofit other aircraft.

These filters, combined with the continuous airflow in the cabin (including while boarding or de-planing), significantly diminishes the risk of viral infection. Add to that the safety practices already in place, such as wearing masks and frequent hand-washing, and the virus risk of flying is lower than going to a restaurant or grocery store, according to researchers at the Harvard T. H. Chan School of Public Health.

But it’s not just the air that raises concerns. Passengers and crew alike are wary of all the surfaces in the cabin that are touched by many people. Certainly, the expansion of mobile apps onboard, as previously described, can reduce or eliminate the need to touch anything but the passenger’s own phone. However, some onboard items are more difficult to control with an app – like the lavatory.

For that particular challenge, Collins is developing a touchless lavatory that allows the user to operate all of the features – toilet seat, flush mechanisms, soap dispensers, faucets, trash flaps – without touching them. It even has a splash guard that virtually eliminates liquid waste particles from entering the environment as an aerosol after the toilet is flushed.

In addition, Collins is experimenting with antimicrobial surface coatings, specialized lighting and other unconventional cleaning agents to provide additional measures to create the most hygienic travel experience possible.
Airports: Streamlined processes, lower costs

One of the greatest challenges for airports as the pandemic lingers on is the need for social distancing. While keeping people six feet apart has been easy in sparsely populated terminals, it will become increasingly difficult as demand for travel ramps up again. The normal congregation of passengers and airport personnel at security stations, gates, baggage claim and other high-traffic areas will have to change – not only to protect against the spread of the novel coronavirus, but because the pandemic has conditioned everyone to be forever vigilant about disease spread in general.

In the aftermath of a pandemic, passengers will expect crowds to be monitored and managed to allow for safe distances between people. Always.

For this reason, Collins envisions a future where airport operators have tools and technology that enable constant monitoring of passenger flow and crowding at key checkpoints. The company is assessing analytics dashboards that track the number of people in any given area and alert operators when too many people are in a particular spot. Over time, this same airport density monitoring system could also provide metrics to inform airport authorities about patterns of operation and ways to make the flow more seamless and efficient.

Combined with an airport wayfinding app – another Collins concept that could allow passengers and visitors to use their mobile devices to find the fastest, least crowded path to their destination within the airport – and congested airports become a thing of the past.

Another tool that would help airports optimize flow is also nearing completion: an advanced gate management system that helps airport operators coordinate turnaround activities. Using machine vision, this system will automate aircraft turnaround management, track and incorporate the new COVID-related turnaround tasks, and leverage dynamic gate schedules. By fine-tuning these activities through automation, operators would not only improve passenger flow and facilitate social distancing, they would also bring new efficiencies to the entire turnaround process and enhance overall on-time performance.

But even with optimized flow, social distancing and other disease mitigation practices in place, airports will still need a way to identify sick passengers. The lesson of COVID-19 is clear: The sooner an illness is spotted, the more you can help the patient, begin contact tracing and reduce the spread.

With this in mind, Collins is applying its broad expertise in biometrics and SelfPass technology to create health screening platforms, such as the one Passenger X experienced. Initially, the screening will capture passengers’ temperatures only, but the company is researching a system, as described in the previous scenario, that will rapidly measure key physiological markers that when measured together will detect passengers with potential respiratory infection. This rapid in-line screen combined with an equally rapid virus confirmatory test could provide an effective way to greatly minimize the health threat to fellow passengers. And if in the future new threats appear this health screening solution will greatly enhance the ability of the aviation industry to monitor, detect and act far faster to lessen the impact.
Like all seismic disruptions in history, the novel coronavirus, too, shall pass. And in its wake will be a world transformed. For the air travel industry, that transformation will be profound. The innovations described here, along with many other new ideas spawned by the pandemic, will be refined, developed and incorporated into the commercial aviation ecosystem, bringing huge improvements to the way the world travels.

Just as the addition of physical security protections after 9/11 brought enduring improvements to the aviation ecosystem, the addition of health security protections will bring equally important and lasting benefits to the travelling public.

In short, the pandemic, with all of its horrors, is a powerful catalyst for change – a great inflection point that will ultimately re-create air travel, making it easier, safer, more efficient, more seamless and more personalized.

In the midst of the pandemic, Collins Aerospace is lifting up the industry by acting upon the opportunity for improvement.

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