

Jetstream

2022 AND BEYOND



GLOBAL AEROSPACE



INSURE WITH CONFIDENCE

Letter from the CEO

I wonder how many people were accurate in their predictions for 2022. At Global, we were full of positive energy following the lockdowns and restrictions endured over the last few years. Aviation traffic was increasing to pre-pandemic levels, and there was excitement about what the year would bring. What we did not predict were geopolitical events that would shake the world, inflation levels not seen for 40 years and, if you live in the U.K., more prime ministers than you may care to remember!



RACHEL BARRIE
CEO, Group Chief Executive

There is a lot riding on 2023, and we think there is a lot to be excited about. Aviation is entering an unprecedented period, with a myriad of new emerging technologies being developed. These new technologies are receiving increasing levels of investment, and we are proud to support the next generation of safe, sustainable air travel. In this edition of Jetstream, we have an interview with Vertical Aerospace, who are developing a four-passenger electric vertical take-off and landing aircraft (eVTOL). Whilst the technology development may be one challenge, creating the infrastructure to support these new aircraft is critical. Alongside passenger aircraft, we discuss the future of cargo and air freight transportation, which has the potential to be revolutionised by the electrification of aircraft leading to reduced costs and new markets.

THIS ERA OF NEW TECHNOLOGY is not limited to passenger and cargo aircraft. NASA have successfully completed their Artemis I mission, which is the first step in increasingly complex missions that will allow for human exploration of the Moon and Mars. Never before has there been such a dependence on space technology, but the industry needs to attract talent. Whilst children may dream of working in the space sector, for it to become a reality, they need to be guided into STEM learning. We explore

our increasing dependence on space and this need for a new generation of space experts.

BACK TO MORE TRADITIONAL TECHNOLOGIES, for there to be continuous aviation safety improvement, data sharing is vital. Using technology to de-identify data is leading to increased participation and a growing body of knowledge that is positively impacting aviation safety. We look at the current state and future of aviation safety data sharing.

Pilot mental health has become an increasingly relevant subject for our clients, particularly following the difficulties of the COVID downturn years. Guest author Dr. Tony Kern discusses pilot mental health issues and provides good advice for us all on how to take back control with his behavioural and mental health programme.

Lastly, when wildlife and aircraft mix, the results can be rather unfortunate, with both animals and aircraft coming off worse for wear! Take a look at the back of this publication to read about some of the rather unusual, but covered, claims we have adjusted over the years.

WISHING YOU ALL THE BEST FOR 2023. Keep count of how many predictions you get right this year! ▼

Fixed-Wing Electric Cargo Delivery: An Enabler for Broader Electric Aircraft Use?

Progress toward certification and operation of new battery-powered aircraft continues at an encouraging pace. Industry leaders are engaged and so are regulators.

While some are pessimistic about the widespread adoption before the end of the decade, the pieces are falling into place that will enable new aircraft and technologies to achieve commercial reality in the near term.

The Challenge for eVTOL

It is not surprising that industry insiders are cautious, given the complexity of developing and certifying electric vertical take-off and landing (eVTOL) aircraft. Add the need to establish the infrastructure this nascent industry requires to flourish and the plethora of operational data needed to create a safety case that will satisfy operators, and caution is understandable.

THE CIRCA 500 URBAN AIR MOBILITY (UAM)

AIRCRAFT in development today are ground-up designs that employ innovative flight controls, motor configurations and power sources and varying levels of automation. Despite the challenges of achieving entry into service, the broader aviation industry is leaning into the technology. As many as 5,000 UAM aircraft have been ordered by air carriers. While most early contracts are letters of intent that do not involve any financial commitment, it demonstrates the potential industry leaders see in new modes of flight service.

The Case for Conventional Aircraft

AS UAM COMPANIES MAKE PROGRESS, a less visible group is developing electric and hybrid-electric aircraft that largely conform to existing infrastructure. Known as electric conventional take-off and landing (eCTOL) and eSTOL (where short replaces conventional), these aircraft will deliver cost savings to the freight and passenger markets that could open new markets to aviation while benefitting from being able to use many current aviation practices.

Additionally, the focus on electrification and use of hybrid power solutions helps maintain the industry's focus on long-term environmental sustainability.

By using automation and reducing crew numbers, it is not hard to see how new technologies will have a significant impact on cost.



TO UNDERSTAND THE POTENTIAL FOR GROWTH, it is worth reviewing a few statistics.¹ In the U.S., aviation dominates passenger trips over 500 miles with a 40% market share. Yet for the under-500-mile market, where road transport dominates, the number drops to just 0.4%. For freight specifically, aviation accounts for only 0.1% of the total weight carried but 8% of the value of what is transported.

This last piece of data suggests there is a market for high-valued goods that could be extended to encompass an array of air freight if the price per mile were reduced.



To emphasize this, worldwide air cargo revenue has almost doubled between 2011 and 2021, from USD96 billion to USD175 billion, thereby outperforming growth when measured by weight, which only grew by 30% over the same period.² Clearly, there is no shortage of demand for expedited air freight services.

Are Cost Reduction and Efficiency Enough To Create New Markets?

It is hard to determine just how much cost (both financial and environmental) can be eliminated from regional air cargo (and ultimately passenger transport) over time through the adoption of electrification. But if the operating expense savings are focused on high-cost areas like fuel (through use of battery power) and crew (by using more automation and reducing crew numbers), it is easy to see how new technologies will significantly impact costs.

Add the potential for quieter aircraft allowing easier access to regional hubs and the ability to link these flights to last-mile drone delivery, and the case becomes clearer still.

REDUCING THE COST OF AIR FREIGHT over short distances can transform regional deliveries. Not only could air transit reduce freight costs, but it also could create opportunities for redeveloping towns that are reliant on expensive ground transportation or even essential air services.

Data, the Great Enabler

OF GREATEST SIGNIFICANCE FOR THE EVTOL and wider emerging technology sector is that data generated by all forms of battery-powered aviation will help make the safety case for the entire industry. eVTOL designs incorporate several groundbreaking features—power supply, build materials, flight controls, rotor configurations and even autonomy. Getting new aircraft over the regulatory finish line will take time, thousands of flight hours and significant amounts of data. Operational experience that other industry pioneers can provide will help.

OF NOTE IS THAT THE VALUE OF DATA AND EXPERIENCE will not be limited to the aircraft. The infrastructure that must be developed to support electric aircraft services, and lessons learned from it, will act as an accelerator for electric aircraft.

eCTOL/ eSTOL companies are pursuing two paths. One involves new aircraft designs and concepts and the other retrofitting existing platforms with alternative power supplies. While both present challenges, their ability to use existing airports and airways will accelerate their adoption.

Progress To Benefit All

Change in the aviation industry has historically been incremental. This has allowed regulators to take a measured approach to certifying new aircraft and technologies. Even establishing a safe, legal framework in the relatively benign world of small drone deliveries is proving challenging for regulators and the industry.

WITH SO MANY NEW CONCEPTS AND PLATFORMS being developed in isolation, commonality with existing aircraft design, use of existing infrastructure and operational progress will benefit every company seeking to break into new areas of air transport. If progress can be made across a variety of aircraft platforms, then widespread adoption of a new breed of aircraft can be achieved in the near term, and a modern era of environmentally sustainable aviation ushered in. ▾

¹ DiamondStream Partners

² Statista Global air cargo revenue 2004-2021 | <https://www.statista.com/statistics/564658/worldwide-revenue-of-air-cargo-traffic/>



Aviation Data Sharing: Crucial to Improved Safety

Several factors play a critical role in aviation's goal of continuous safety improvement. One of the most important is the sharing of incident data. This practice, which originated in simple observations shared informally within flight departments, has been enhanced by technology and the efforts of many industry experts advocating for its increased adoption.

TODAY, DATA RECORDED and categorized following a set of standards and made widely available is helping aviation organizations learn from the experiences of others and avoid costly property damage, serious injuries and even fatalities. The information gained on problems encountered and solutions identified has enormous value in enabling organizations to predict accidents and implement mitigations to help prevent them. Aviation businesses of all types and sizes, and all functional areas within them, are benefiting from implementing data sharing practices.

De-Identified Information as the Cornerstone of Data Sharing

DESPITE THE CLEAR AND SIGNIFICANT BENEFITS of data sharing, aviation professionals are often conflicted about documenting incident information and making it available to others. Pilots, operations managers and others, who are collaborative by nature, want to contribute to the body of knowledge that is powering aviation safety improvement. However, they are concerned about the repercussions if reports expose errors on their part or that of their peers.

What may not be as widely known as it should be is that today's data-sharing systems *completely de-identify* information at many levels before making it available. No one involved in developing, managing or promoting these systems wants to create problems related to confidentiality for those prepared to share information. Their singular focus is disseminating vital information that can prevent property damage and injuries.

The key is for an aviation entity to get started in data sharing in the ways and to the degrees that align with its comfort level as a foundation for greater involvement.

The Many Forms of and Forums for Data Sharing

Pilots, flight crews, ground crews and other stakeholders can share their operational challenges and strategies for success in several ways. This includes through the FAA's Aviation Safety Information Analysis and Sharing (ASIAS) program and hundreds of data and information sources across government and industry that feed into its data repository.

“Scheduled air carriers have been sharing safety data for decades, resulting in an incredibly low accident rate. Bottom line: Sharing data works to reduce accidents and risks,” says Baldwin Safety and Compliance President Don Baldwin. “The business aviation community is just getting started in data sharing through ASIAS and regional safety sharing programs. These low-cost tools are effective and readily available today for all operators, large and small. I can’t emphasize enough how important data sharing is for reducing accidents and risks to the low levels achieved by commercial air carriers.”

BUT THESE SYSTEMS ARE NOT THE ONLY AVENUES for gathering and disseminating incident details and solutions. Internal hazard reporting databases, automated flight operations quality assurance (FOQA) technology and even internal mentorship programs are effective ways to share data. They can help everyone “learn from the mistakes of others” — which is a safe and highly effective form of aviation education.

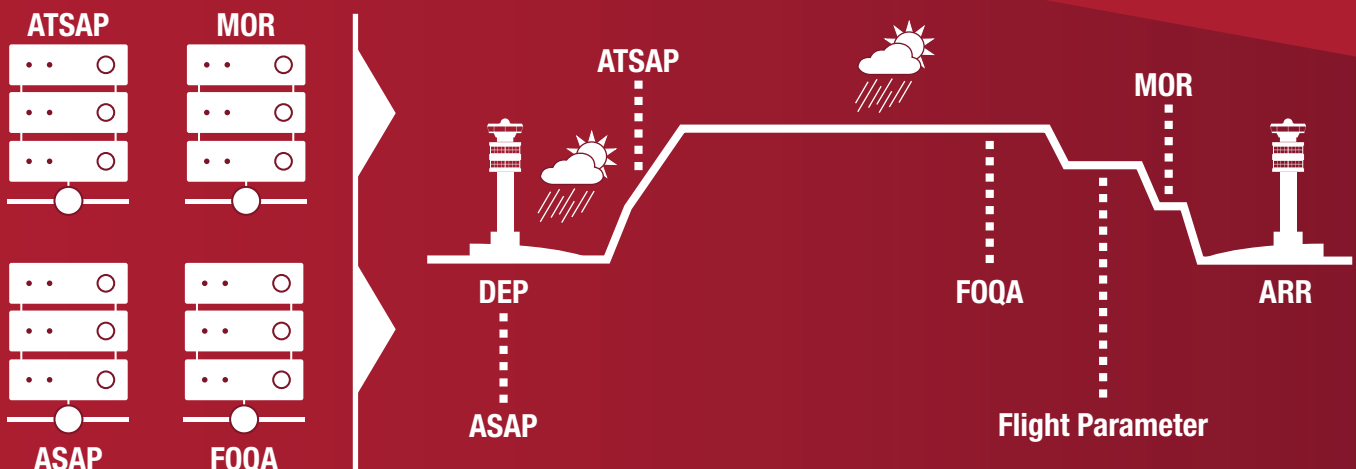
Data Vetting and Decision Autonomy

Individuals and organizations that participate in data-sharing programs surely do so in good faith and with the belief that their information will promote the common good in aviation. That being said, entities that collect data typically vet it to a degree, which is helpful, particularly for smaller aviation organizations that may have no prior experience with a particular scenario and no framework for assessing the effectiveness of a solution.

OF COURSE, THE VALUE OF AGGREGATE DATA to a particular organization is further enhanced by its team members balancing it with their own experiences and knowledge of their risk environment. Data analyzed and acted on in this way has the greatest potential for improving operations and enhancing safety.

Pilots, flight crews, ground crews and other stakeholders can share their operational challenges and strategies for success in several ways.

ASIAS Fusion



AT SAP: Air Traffic Safety Action Program **MOR:** Mandatory Occurrence Report **ASAP:** Aviation Safety Action Program **FOQA:** Flight Operational Quality Assurance
Data-fusion analytics (“Fusion”) bypasses the limits associated with analyzing data found in separate “silos” of information, provides insight from multiple sources, and enables analysts to better understand the context of safety events. Source: https://www.faa.gov/sites/faa.gov/files/2021-11/FAA_Report_on_Aviation_Safety_Information_Analysis_and_Sharing_ASIAS_03312020.pdf

Hurdles to Information Dissemination

IT IS IMPORTANT TO RECOGNIZE that many factors can contribute to aviation organizations not actively participating in data sharing. One is the belief that uncovering ongoing issues will force the business to incur costs related to changing processes or providing specialized training.

Another factor is that some stakeholders simply have not been exposed to data sharing and consequently do not fully understand its benefits. And even when they have learned about its advantages and are ready to move forward, initiatives often stall when decision-makers realize they do not know how to get started in data sharing.

FORTUNATELY, THERE ARE WAYS to overcome objections to data sharing. For instance, it can be beneficial to explain to stakeholders that transparency about incidents and a commitment to viewing mistakes as learning opportunities can decrease employee turnover, which can be significant and costly for these organizations.

Promoting a continuous-improvement culture can also catch the eye of potential clients, resulting in increased business opportunities. In addition, aviation businesses reluctant to report incidents can be shown how their industry peers have benefited from data sharing and how their organization could leverage the practice.

Steps To Expanded Data Sharing

ORGANIZATIONS SHOULD UNDERSTAND that data sharing does not have to be an “all-in” proposition. Aviation businesses can and do provide varying amounts of information to various data management systems. Often, submitting certain types and limited quantities of incident reports helps build trust in the collection and analysis process. Then, as the organization’s confidence grows, it increases the depth and breadth of its reporting.

MANY ORGANIZATIONS START WITH ACTIONS as simple as encouraging line personnel to have conversations with flight crews when an incident occurs. Open and honest discussions focused on identifying causes and brainstorming solutions can set the stage for sharing details about incidents more broadly. Were there visual distractions (an awareness issue)? Did they push the wing into the fence because they didn’t know that the wing grows when the aircraft turns (a training issue)? Was an action completed hastily by an overworked team member (a staffing issue)?

The key is for an aviation entity to get started in data sharing in the ways and to the degrees that align with its comfort level as a foundation for greater involvement. Some organizations begin with internal sharing, progress to NDA-governed local roundtable discussions, move on to using local or regional systems and finally begin providing information to national databases.



AS FOR LEVERAGING COLLECTED DATA, there are essential elements for maximizing its value. First, aviation organizations must learn about where they can obtain data. Like reporting options, data sources may be local, regional or national. Next, entities should consider how they can use the information. And finally, they must evaluate the reports and implement the appropriate mitigations for their operations.

The Future of Aviation Data Sharing

The outlook on the collection, categorization and dissemination of “clean,” de-identified aviation incident data is bright. Stakeholders are increasingly confident in the process, aware of the benefits and eager to capitalize on collective insights to improve their operations.

MUCH WORK REMAINS FOR EVERYONE in aviation to increase awareness of the importance of data sharing and encourage participation in programs at all levels. But the progress to date and steadily growing body of knowledge are already positively impacting aviation safety.

ONE CAN ENVISION AND HOPE FOR A FUTURE in our increasingly connected world, where the vast majority of aviation incidents are reported in near-real-time fashion, providing immeasurable benefits to our industry and everyone who participates in or relies on it. ▾

Space and STEM: Exploration Requires Talented New Recruits

How often do you check your smartphone for messages or look something up on the internet?

How often do you use a map application? How often do you look at the weather forecast? For many people in the developed world, the answer is at least once a day.

The Role of Space in Our Lives

What proportion of the population who use these services knows that space and satellite systems play a critical part in providing them? The answer is probably a surprisingly small percentage. In fact, a recent survey carried out by Inmarsat suggests a sizeable population associate “space” with science fiction, Star Wars and aliens.¹

Of course, there are many other critical applications of space systems, including disaster monitoring, search and rescue and climate monitoring to name but a few. There are secondary benefits too, with many pioneering and innovative space technologies improving our lives on Earth.

AS THE SPACE INDUSTRY GROWS, so does the economy. Current estimates of the global space economy stand at over USD350 billion. This figure is expected to exceed USD1 trillion by 2040.² With space so critical to modern life, how do we communicate its importance to people and recruit them into the industry?

Inspiring People

THE FIRST SPACE AGE saw Russia’s launch of the Sputnik 1 spacecraft in 1957, Yuri Gagarin’s first space flight, the 1969

Apollo 11 Moon landing and the safe return of the Apollo 13 mission. Many people who witnessed these events at the time were inspired by what humans could achieve.

HUMAN EXPLORATION OF SPACE in the following decades was somewhat closer to home with building and living on space stations, the latest and largest being the International Space Station. Whilst the Russians have continued to use their Soyuz rocket and spacecraft originally developed in the first Space Age for transport to and from the ISS, the U.S. developed the Space Shuttle. However, with the ever-increasing cost of space missions and two high-profile accidents came the end of the Space Shuttle era, and the public’s interest in space waned... until now.

COMMERCIALISATION OF SPACE, dramatically reduced cost of space access and an exponential increase in space applications on Earth have led to innovation on an unprecedented scale. We are also finding new scientific discoveries with early images from the newly launched James Webb Space Telescope. No doubt, all these will once again inspire future generations.

Need for Talent in the Space Sector

Estimates suggest around 1 million people were employed in the global space sector in 2017.³

Space for Good

Sentinel-5 Precursor is the first Copernicus mission dedicated to monitoring our atmosphere. With air pollution a major concern, this new satellite carries the state-of-the-art Tropomi instrument to map a multitude of trace gases such as nitrogen dioxide, ozone, formaldehyde, methane, carbon monoxide and aerosols—all of which affect the air we breathe and our climate. Data will be used for the Copernicus Atmosphere Monitoring Service, monitoring air quality, global emission inventories and UV warnings. Data will also support volcanic ash monitoring services for aviation safety.

Credit: https://www.esa.int/ESA_Multimedia/Images/2017/09/Copernicus_Sentinel-5P_Europe_s_air_quality_monitoring_mission



If the space economy is to grow, we will need to attract substantial new talent to the industry. With the majority employed in the industry being scientists and engineers, getting more young people into the science, technology, engineering and maths (STEM) fields is essential.

As with any learning, earlier is better for children to be exposed to the world of space and for us to grab hold of their imagination. The industry, from space agencies and private companies to universities and research organisations worldwide, has resources to make STEM subjects relevant to space. Many also have extensive outreach programmes and online resources to get young people around the world excited about space.

ARTEMIS I STEM LEARNING PATHWAY – NASA

Whilst NASA has a very large learning resource, they also have mission-specific programmes. The Artemis 1 comprises a vast array of resources from hands-on activities for families and kids to competitions for students of all ages. This includes NASA App Development Challenges (coding for mission design) and the Human Exploration Rover Challenge (design, build and test a human-powered rover suitable for lunar surfaces). <https://stem.nasa.gov/artemis/>

EUROPEAN SPACE EDUCATION RESOURCE OFFICE – A COLLABORATION BETWEEN ESA AND NATIONAL PARTNERS

ESERO-UK has a vast array of curriculum-linked resources and STEM Ambassadors that can support space-related activities at schools. For example, the UK CanSat competition has students design, build and launch drink-can-sized payloads on small rockets. <https://www.stem.org.uk/esero>

STEM & SPACE Based in India, STEM & SPACE offers astronomy camps, kids clubs and an astronomy-focused Olympiad, as well as online resources for all school age groups. <https://stemandspace.com/>

ORBIT FOR EVERYONE – VIRGIN ORBIT/GALACTIC UNITE Virgin Orbit offers factory tours for students, local community grants for STEM education activities, and mentoring and scholarships, especially to underrepresented minority groups. <https://virginorbit.com/orbit-for-everyone/>

SPACEPORT CORNWALL Spaceport Cornwall has a great online resource for learning about the space industry, including school-curriculum-linked challenges and career advice that incorporates where young people can study if they want to work in the space sector. <https://spaceportcornwall.com/education/> ▼

¹ 'What on Earth is the Value of Space' report - Inmarsat

² Satellite Industry Association/BryceTech, Morgan Stanley Research

³ The Space Economy in Figures: How Space Contributes to the Global Economy – OECD 2019



Pilot Mental Health: Mental and Behavioral Health Is a Very Special Challenge for Aviation

Piloting, by its very nature, is stressful. We rocket into the air in high-performance vehicles made of lightweight material, flying at hundreds of miles per hour at altitudes where our time of useful consciousness is measured in seconds if we spring a leak.

WE SIT ON TANKS FULL OF HIGHLY FLAMMABLE FLUID, navigating around thunderstorms whose lightning temperature exceeds the surface of the sun and bring aircraft, passengers and cargo into highly congested traffic areas to land at high speeds on tiny ribbons of concrete. There is a lot of energy in the systems we operate.

So, yeah, it can be a bit stressful, even before we add scheduling pressures, time away from family and constant changes due to weather and customer demands. Almost every “most stressful jobs” list has “commercial pilot” listed in the top 10.

And that was all before the world went topsy-turvy a couple of years ago. To understand the implications of all this on pilots, as well as the thousands of ground personnel who support them, let’s step back and look at the changing nature of work itself over the past few years.

The Changing Nature of Work

From a personal, organizational and societal perspective, the concept of work is changing. Aside from the typical drivers of technology and generational differences we have seen change the aviation workplace throughout history, something different is going on. We seem to be engaged in meaningful discussions about the very philosophy of what work is and what it means. Like all philosophical discussions, people are taking sides. Before diving into the debate itself, let’s briefly consider the traditional drivers and what they mean.

FROM A HISTORICAL PERSPECTIVE, technology has changed the nature of work in ways we have never seen before, and perhaps not as we thought—or hoped—it would. From the earliest days of personal computers and the internet, we were told how liberating it would be to work anytime from anywhere. What we found was this would eventually come to mean working all the time

from everywhere. No longer would the 5 o’clock whistle indicate quitting time, a concept that has lost all meaning.

OUR WORK NOW STALKS US EVERYWHERE WE GO.

Early on, hard-driving Type A folks reset the expectations for the rest of us, and our organizational leaders saw the advantages and did nothing to adjust. We all became invisibly tethered to our jobs 24/7/365. Many resented this, but few resisted. It became the new norm. Pilots on duty are protected with FAA and organizational crew rest and duty time limits. Still, many wear several “additional duty” hats where the “all the time, everywhere” nature of 21st-century work takes its toll.

Generationally, we moved from a workforce of digital immigrants to digital natives almost overnight. Recent data shows nearly 60% of the workforce is now millennials and generation Z, both of whom grew up with cell phones in their hands, computers in their classrooms, and likely, in their bedrooms, too. As work became more and more reliant on tech-savvy employees, this seemed like it would be a good thing for everyone. But something else happened that changed it all.

A NEW INDUSTRY EMERGED that would have a greater impact on the mental health of employees than anything previously known. From the start, social media was designed around a business model that relied on user engagement. The longer they kept us engaged, the more

*High-risk endeavors
like aviation are
no place for a
quiet quitter.*

data they collected on our personal interests. The more they fed our interests, the longer they kept us engaged, resulting in an ever-deepening progressive spiral, creating digital dependents out of us all. Good for them, very bad for the rest of us. We thought we were getting a free service, but instead, we became the product.

ENGAGEMENT IS A ZERO-SUM GAME. As we became more engaged with the relentless push of addictive content, we became less engaged with work (and other aspects of our lives as well). With this loss of professional engagement came a loss of the meaning and value we used to feel by contributing to the collective efforts with our work colleagues. Multiple studies have found excessive social media screen time effects include depression, anxiety, insomnia, negative self-perception, brain fog, obesity, unhealthy diet and decreased physical and cognitive abilities. The aviation workforce is not immune to these impacts.

AND THEN CAME COVID TO MAKE MATTERS WORSE. The long-term effects of the COVID lockdowns will be studied and debated for decades, but one thing is obvious. Except for those who kept us all from starving, we all went home to work without the necessary structures, supervision or tools to keep us engaged in our professions. Into this void of meaning and process crept the inevitable malaise and deep questioning of what “work” really means.

Quiet quitting—the idea that we should only do what is absolutely necessary to earn a paycheck—is not new, but it is very real and growing. The problem in aviation is that we can never be sure what might become absolutely necessary on any given day in the air, at the dispatch desk or in the maintenance hangar. High-risk endeavors like aviation are no place for a quiet quitter.

“Mental Health Crisis” Doesn’t Begin To Describe What’s Happening Right Now

It seems every week we read a new statistic on record-setting suicide rates, violent crime, drug use, domestic violence, depression, anxiety and alcoholism. Two years of stay-at-home schooling added tremendous pressure not only for kids but also for parents.

Here’s the weird part. Despite all this, on average, around the globe, people are healthier, wealthier, more literate, live longer lives and are safer than at any point in human history.

At the same time, we are also more pessimistic, stressed out and anxious than ever. So, where do we go from here?

Taking Back Control

It seems that a behavioral and mental health program¹ that is holistic in nature and simple to apply is essential. It must revolve around taking personal control and building our cognitive, behavioral, emotional and spiritual strength, and perhaps most importantly, creating a personal life mission statement to anchor the entire effort. Here are a few things I believe we might all do well to try.

1. BOYCOTT THE “ATTENTION ECONOMY.”

Unplug from the polarizing distractors on the internet. Initially, this will cause a bit of anxiety, but like all addictions, once it is broken and we take back control of our time, we will see a powerful increase in our focus and engagement with things that really matter.

2. REMEMBER WHY WE GOT INTO AVIATION IN THE FIRST PLACE.

Whether it was our childhood dream to fly or simply become a part of a dynamic group of high achievers, recalling all of the hurdles we had to clear to become a part of this wonderful industry brings us closer to our original purpose and joy.

3. FIND SOMEONE OR SOMETHING TO MAKE BETTER.

The door to high performance and happiness opens outward. When we are giving, it’s harder to be anxious about whatever we aren’t getting out of life. Don’t fall into the trap of becoming an online troll who thinks they are supporting a cause (see #1 above) but instead find something real—and ideally local—where you can make a difference.

WE LIVE IN INTERESTING TIMES. But staying safe and effective and getting all of the enjoyment we deserve for making the grade in this industry are really just hurdles along the way. ▼

Author: Tony Kern, Ed.D, Chief Executive Officer, Convergent Performance

¹ For more information on Dr. Kern’s Armored Knight Psychological Strength Building program, contact him directly at tony@convergentperformance.com



Future Flight: The Rise of Advanced Air Mobility

With companies and investors committing billions to the emerging Advanced Air Mobility (AAM) market, there are many opportunities and challenges ahead for the sector.

We spoke to Vertical Aerospace, who are developing the VX4—a 4-passenger, single-pilot, electric vertical take-off and landing (eVTOL) aircraft—to find out their perspective on the journey ahead.

Questions for Vertical Aerospace

With the development of AAM aircraft progressing rapidly and the potential for operations commencing in 2024, what will the infrastructure required to operate these aircraft look like in the early stages?

These new electric aircraft will need an ecosystem to fly commercially—ground infrastructure to land and take off, of course, as well as air traffic control and air traffic services, charging and power supplies, maintenance and aircraft services and regulation and public engagement.

That ecosystem will be built over time from a mix of existing elements and new ones. We aren't talking about a completely new system opening on day one of AAM flying. It is about how we pragmatically make all the parts work safely and expand capacity and efficiency over time.

We believe we will learn best by doing. That is why Vertical Aerospace, together with Virgin Atlantic and partners including Heathrow, Atkins, Skyports and NATS, are building a first-of-a-kind ecosystem to accelerate introduction of AAM in the U.K. This consortium of partners has been granted £9.5 million of government funding from the “Future Flight Challenge.”

The consortium will be creating and testing technological developments in aircraft electrification, airspace management and ground infrastructure to implement a new model of aerial passenger transport in the U.K.

Does the U.K.'s limited size and congested airspace present a greater opportunity for AAM solutions compared to other locations that already have a large general aviation presence such as the U.S.?

Vertical has over 1,400 aircraft on conditional pre-order across the world. We are seeing real opportunities in all kinds of regions—from Sao Paulo in Brazil, to Malaysia, or western Japan or multiple U.S. states. So, there is no lack of opportunity across lots of geographies and countries.



The flights look similar across many regions—transfers to airports, filling short distance gaps in transport networks and tourism. It is certainly true the U.K. provides ample opportunities to deliver safe, clean, quiet travel. We are delighted to be working with Virgin Atlantic to offer VX4 flights in the U.K. in the future.

For instance, consider Belfast to Glasgow. The 2.5 to 4 hours via domestic airplane flight, cars and ferries could be cut to 47 minutes. A Manchester-to-Liverpool journey that would take 2.5 to 3 hours via train or car could be cut to 50 minutes via VX4. Both save money and, critically, carbon versus existing ground or air transport options as well. Further examples can be found in Vertical's AAM white paper.¹

Do you foresee existing airports being used as AAM hubs with customers using AAM aircraft as the first/last leg of an international journey?

Absolutely. It is one of the three very common types of flight we are seeing with customers around the world. AAM connecting to traditional flights is a great opportunity for airlines to offer safe, fast and comfortable onward journeys.

Much has been spoken about an air taxi use case for AAM. Is there adequate investment in city vertiports to make this a reality?

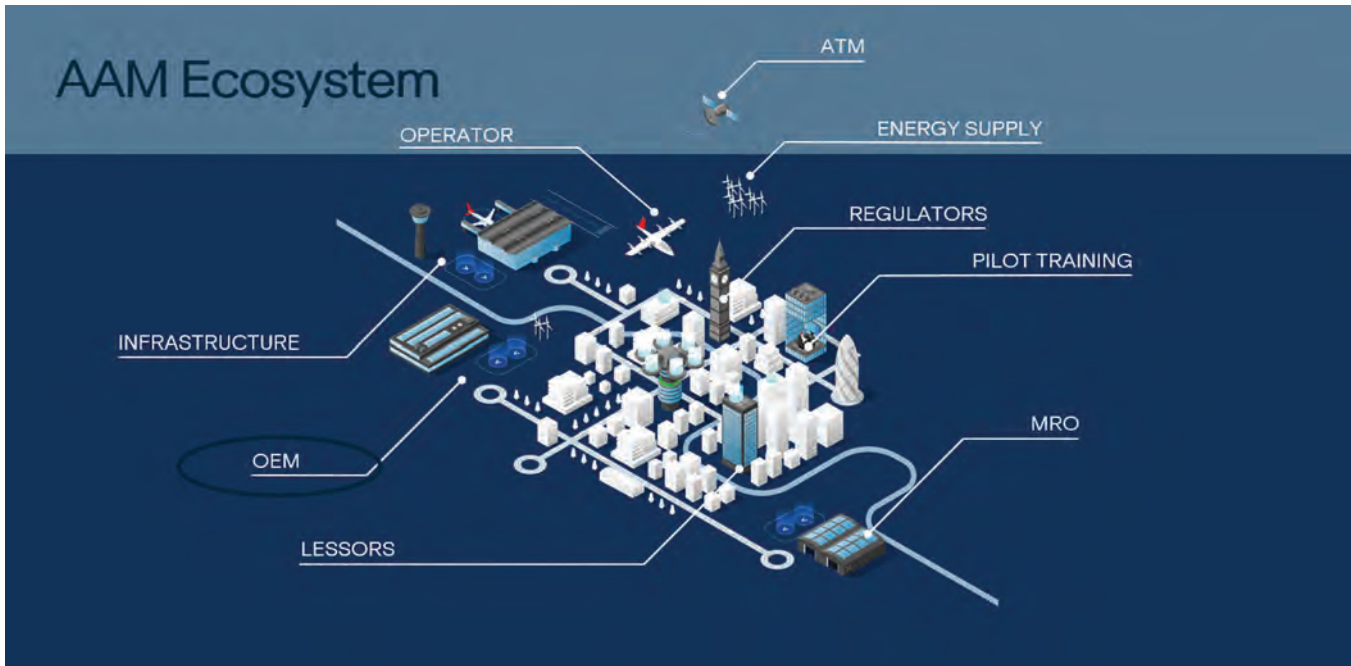
It depends on what you mean by “air taxi.” We don't believe we will see electric aircraft flying people a few blocks around a city in high volumes anytime soon.

The flights look similar across many regions—transfers to airports, filling short distance gaps in transport networks and tourism.

There are lots of reasons for that, of which the lack of places to land is only one. Airspace, the economics and physics of very short flights, the rate at which aircraft can be produced and competition with other very-short-distance-travel options all make that a challenge or something that will take time to emerge.

What quiet, safe, electric aircraft do allow is lots of very compelling links from cities over distances of 30 to 100 miles, resulting in significant time savings as well as saving money and carbon in most cases. They will require places to land in cities—just not on every block or rooftop. For example, in Sao Paulo, Tokyo or Los Angeles, there are scores of helipads already across the cities. The constraint on using them is about safety and noise—issues that these new aircraft can address. In other cases, we will see new places being created.





There are already many firms we are working with such as Ferrovial, Skyports and InfraAmerica looking at developing and investing in these too.

How will passenger security, an integral part of airline travel, be achieved in the AAM ecosystem where you have aircraft using non-airport locations?

Security will always be an integral part of commercial air travel. Travel on AAM aircraft will be of known passengers, in secure cabins with a pilot in an isolated, secure cabin. There are multiple, redundant systems on the aircraft and on the ground ensuring both security and safety. This will make AAM aircraft safer and ensure tighter security measures than are in use with most general small aircraft in the skies today, which are already very secure.

Passenger physical screening in an airport has become commonplace for large commercial aircraft. It is worth recognising that this is not needed or done for smaller aircraft, commercial or otherwise, or at most smaller airfields, with no loss of security. Nor is it done on other public transport in cities, such as rail, subways, buses or taxis. There is no compelling reason or risk-based rationale to do so at AAM vertiports.

Travelling through vertiports in the future will be quicker than large airports, but it doesn't mean it will be any less secure. We're sure vertiports and operators will be putting appropriate measures in place.

Exciting Times Ahead

It is fascinating to hear about the new opportunities that AAM will create for the aviation sector, utilising new aircraft technologies that will improve connectivity whilst advancing the industry's green credentials. It is clear that the ecosystem surrounding this new breed of aircraft is vital to their success, and we look forward to following the ongoing developments in this space. ▼

¹ <https://vertical-aerospace.com/wp-content/uploads/2021/10/The-Future-of-Advanced-Aerial-Mobility.pdf>

What quiet, safe, electric aircraft do allow is lots of very compelling links from cities over distances of 30 to 100 miles.

“The Claim Is for What?” Some Unusual (but Covered) Incidents

Flight crews are trained to be ready for anything.

“Anything” can run the gamut from mechanical problems to in-flight medical emergencies to extreme weather. As many aviation operations and insurers have learned, that list should include animal encounters. Below are details of actual incidents that led to costly claims and some priceless stories.

How Does an Elephant Scratch an Itch?

A Beechcraft King Air was parked outside on an African game reserve. When the pilot returned in the morning, he found damage to the fuselage skin and left wing.

WHAT COULD HAVE CAUSED SUCH DAMAGE?

With a bit of detective work, it was determined that a large animal—likely an elephant—had rubbed against the aircraft. People familiar with elephant behavior speculated that the huge animal had used the plane as a “scratching post.” When you’re that big and have an itch you can’t reach, you’ve got to get creative!

Lesson learned: Avoid leaving aircraft outside at night if you can—especially if there are large beasts about.

Deer in the Landing Lights

Our insured operates a Gulfstream G650 for Part 91 purposes. After a short flight to a regional airport in the

Southeastern U.S., they were surprised to learn they had had an undetected animal encounter.

AS GROUND CREWS TOWED THE AIRCRAFT INTO THE HANGAR, they discovered an antler lodged in a flap. The pilots hadn’t seen or felt anything as they landed, and no other evidence of a deer was found on the aircraft or the runway. But somewhere that day was an animal with a serious headache.

The High Cost of a Meal

An incident that had an unfortunate physical and financial ending occurred on an autumn day. A chipmunk was doing whatever it is that chipmunks do when a red-tailed hawk unexpectedly nabbed him. Snack time! However, a fellow hawk coveted this prize, and a battle was on.

THE AERIAL DOGFIGHT DRIFTED ONTO THE GROUNDS of a major airport. As the battle raged five feet above a runway, the chipmunk and both hawks were unceremoniously ingested into an engine affixed to a widebody commercial jet that had just landed.

The aircraft was using its reverse thrusters—an operation that takes place at full engine power. Needless to say, the trio met an unpleasant demise.

The encounter was similarly unfortunate for the aircraft’s engine. All fan blades and the fan case were destroyed. Fan blade fragments subsequently damaged the nose cowl and thrust reverser cascades. The impact also damaged the compressor section, and the blades sustained tip-rub in the turbine section from severe vibration due to imbalance and, ultimately, engine seizure.

What’s more, the flying debris damaged the fan blades and nose cowl on the opposite engine and various parts of the airframe. The resulting claim cost more than USD5 million.

The Morals of the Story...

CHIPMUNKS: Keep an eye on the skies.

RED-TAILED HAWKS: Never let hunger affect your situational awareness.

CLAIMS ADJUSTERS: Note that ingesting wayward wildlife can be very expensive. ▼





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