# WSP

# AGILITY UNDERPINS FUTUREPROOF AIRPORTS

## Providing spaces and services to support future travel demand and changing passenger preferences

Airports are at a crossroads, challenged to make decisions that will shape a strong future in the aftermath of the COVID-19 pandemic. Moving forward from a severely disrupted airport ecosystem requires a new way of thinking that incorporates agility at the core of all efforts. But what does agility involve? How can agility prepare airports for rebounds in air travel and effective response to heightened passenger expectations? In the following Q&A, Tim Morrison, Aviation Director, WSP in the UK, discusses how this capability can facilitate sustained positive change and support performance for years to come.



### *What is agility in the context of an airport, and why is it essential?*

**Tim Morrison**: Agility is the power to adapt and adjust in a timely way; it is also the ability to anticipate and be responsive to customer needs. Agility requires an airport planning strategy that builds in flexibility.

An agile airport combines several key actions: embracing digitization to improve operations and and continuously advance the passenger experience; adapting to different economic models; and deploying Modern Methods of Construction [MMC] during redevelopment—all within an overarching decarbonization wrapper.

To be fully agile towards achieving optimal continuous service, each of these facets must reach their full potential. Taking a Future Ready[1] perspective will enable the best possible impact. Future Ready considers key trends—related to society, climate, resources, and technology—when making decisions to support today's and tomorrow's needs.

Airports are dynamic ecosystems, able to respond to change while also being catalysts for change. This dynamism has already been demonstrated in various ways, such as their finance structure, be it public or private models or a combination of them; the application of technology enabling seamless home-airport-destination travel experiences as well as contactless security and CT [computerized tomography] scanning; and by creating opportunities to advance the airport experience rather than encouraging passengers to rush through, to and from the gate. Airports have long embraced DfMA [Design for Manufacture and Assembly]; this MMC philosophy is the best way to expand and redevelop airports whilst maintaining operations. Utilizing pre-assembled modules—a kit of parts—is key. Looking into the future, facilities should embrace re-using a given kit of parts over and over again in different configurations to suit varying spatial

requirements. This re-use practice, a natural extension of the MMC approach, enables projects to drive down the use of raw materials and reinforces the circular economy mindset too.
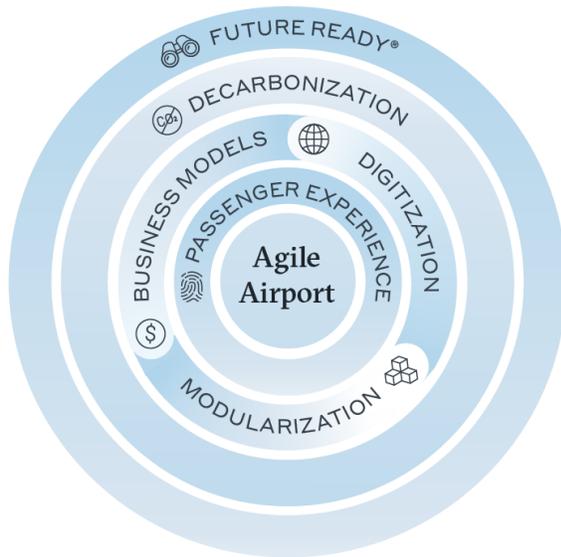


Figure 1 – Key aspects to develop agile airport ecosystems

***The impact of COVID-19 continues to test response and recovery capabilities across sectors and societies. How can airports leverage this experience as they move forward?***

**Tim Morrison**: The last year has clearly demonstrated the importance of being agile or nimble, words not typically associated with airport infrastructure.

This agility is a function of mindset and behaviour and of the physical infrastructure. Experience over the past year has promoted a rethink regarding our surroundings and how to carry out business in an environment that will require business and industry to rapidly respond to more unexpected events; future occurrences will likely necessitate expediting or modifying plans to accommodate new needs.

Certainly, 2020 presented new considerations, such as how to integrate testing centres, quarantine hotels, alternative queuing; and how to use robots to maintain hygiene standards safeguarding staff and the public; it has also underlined the need for airports around the world to operate as highly diverse businesses in order to cope with the drop-off of traditional aeronautical revenues. Alternative non-aeronautical revenue opportunities include conference facilities, hotels, public arenas, sports facilities, pick-up points for internet retailers, leisure facilities, food and beverage destinations, quick-change stands or pop ups, and even pet kennels.

The agile mindset will help airports to embrace diversification of the traditional airport landscape. Contemporary airport designs have been exploring potential uses of airport spaces within and around these sizable built assets to make airports a destination and help them integrate further into their adjacent communities. This process started some years before the pandemic and will likely accelerate now—the pandemic has highlighted the vulnerability of non-aeronautical revenue generation, which has typically been associated with the flying passenger.

***You mentioned that agility is not typically associated with airport infrastructure. Can you explore agility in relation to new assets and existing assets?***

**Tim Morrison**: Airports represent a massive investment in fixed assets. These assets—terminals, runways, taxiways, carparks, rail stations, offices—are all built with a purpose and a lifespan. To be competitive, airports will increasingly need to repurpose these assets—to reinvent the uses of the assets and/or ensure they can expand or contract over time to support

travel demand[2] and changing passenger preferences. The art of agility is to ensure the output solution to the original brief is not so rigid that the use is singular and therefore prevents any other use in the future, thus requiring a demolition to start again. This adaptability does not need to be accompanied by an increase in capital costs.  In fact, the valuation of the built assets when they have this inherent adaptability will be greater as they will not have the traditional shelf life.

This 'loose fit' response to the brief does require a way of thinking that supports flexibility from the planning stage of infrastructure projects through the lifecycle of the asset. Using a digital toolkit, we are now more than ever able to create scenarios for well-considered decision-making. Indeed, the "what if" permutations are aplenty. The application of the digital tools by innovative thinkers also allows assessment of the asset's investment value in terms of the embodied carbon, not just the operational carbon. This whole-life carbon approach to development analysis will come to the fore as aviation endeavours to meet its "license to grow" challenge.  Whole-life carbon assessment is the rapidly emerging environmental measure associated with the built environment. This approach broadens consideration of carbon emissions, moving away from the focus on operational carbon in decision-making to tackle embodied carbon. Unlike operational carbon, which can be improved during the lifetime of a building, embodied carbon is all the emissions associated with the materials used—arising from extraction, manufacturing, transportation, installation, maintenance, and disposal.

The whole-life carbon analytical approach to the use of existing assets based on criteria such as

embodied carbon will be driven by use of alternative materials in designs and digital tools that support such innovative applications.

## *What lasting positive change can an agile mindset bring to the severely disrupted airport ecosystem?*

**Tim Morrison**: While the pandemic experience has been harrowing, it has also presented opportunity to explore how to take stock and ensure we build back in ways that allow us to integrate fast-moving initiatives, especially those related to creating greener flight. This imperative requires collaborative efforts to accelerate the use of sustainable aviation fuel (SAF) and embark on paths to embrace hydrogen infrastructure and electrification of built assets, specifically ground support equipment and aircraft and; there is also a need to determine how to incorporate AAM and UAM [advanced air mobility and urban air mobility] into the airport matrix. Each of these functions requires foresight, a will to embrace change and an appreciation of the transition periods. None of these will be overnight interventions; they will develop and co-exist for many years alongside existing infrastructure. These green initiatives are key to meeting sustainability objectives and supporting the 2050 net-zero goal. There is a nice circularity here when considering these future aviation fuels and the local community; airports could also become the local hydrogen vehicle fuel recharging station and electric vehicle recharging facility, offering business diversification and a service to the local community.

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[2] "The Impact of COVID-19 on the airport business and the path to recovery," Advisory Bulletins, Airports Council International (ACI), March 25, 2021

As travel rebounds at different paces around the world, successful airports will be agile airports—those with adaptable physical infrastructure that enables effective response to changing circumstances resulting from a range of factors, be they economic or political events, a seismic mood change in retail, climatic disruptions, a national or international security incident, or a global pandemic.

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