



AIRPORT PLANNING EMBRACES FUTURE TRAVEL

Turning challenges into opportunities within the aviation matrix

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In the following Q&A, WSP planning and advisory experts propose ways to advance the airport planning process as aviation grapples with rapid change and heightened uncertainty amid travel rebounds.¹

Experts: Bosco Rodrigues, Technical Director, Airport Planning and Advisory Services Leader, WSP in the United Kingdom; John van Woensel, Vice President and National Aviation Planning Manager, WSP USA; Greg Ballentine, Senior Project Manager, Aviation Planning & Advisory Services, WSP in Canada; Arnold (Arnie) Rosenberg, now retired from WSP, led many planning projects at the company.



What are the essential elements of airport planning today?

Bosco Rodrigues: The foundation of effective contemporary airport planning lies in our ability to work in unison with an increasing array of stakeholders to reach an optimal solution for the short-, medium- and longer-term advancement of an airport. This cross-pollination of ideas as well as the exponential growth in data analytics are both liberating and intellectually challenging in equal measure. The pandemic, for example,

has required airport planners to rethink what is an appropriate amount of space per passenger for health and safety reasons whilst also improving service quality as a potential benefit. Over time, technology will likely facilitate implementation of a more cost-efficient solution.

Empathy and understanding move us away from the siloed mentality that often characterized past practice to a holistic one; this perspective enables adoption of new approaches and technologies to address the pressing concerns of today and tomorrow. Only through a more cooperative and highly collaborative planning process can airports identify, prioritize and address issues in a sustainable manner.

John van Woensel: I think the cross-pollination point is true for internal airport stakeholders as well as external ones. In the US, what we sometimes see is a lack of true acceptance, let alone support, for a plan that was developed in an organizational stovepipe. The plan may be signed off by the director, but if various departments and stakeholders conclude that the process did not consider their concerns, they will not support it; this lack of buy-in will likely result in a shelved plan, rather than one that could have led to a broadly beneficial outcome.

Bosco Rodrigues: Effective planning also enables airports to respond in a timely way to changing circumstances. Planning has traditionally called for simultaneous consideration of socioeconomic issues and the

¹ [“The Impact of COVID-19 on the airport business and the path to recovery.” Advisory Bulletins, Airports Council International \(ACI\), March 25, 2021](#)

connection of strategic and tactical requirements; however, the acceleration of technological advancement and growing attention to societal and environmental issues, notably the urgent need to reduce carbon emissions, require professionals to think and manage processes in an agile way.

Greg Ballentine: The multidimensional nature of the planning process makes transparency and stakeholder engagement necessary actions from the outset; it is important to engage airport stakeholders, including tenants, operators, government agencies and the general public, throughout the planning process, and all should all have ample opportunity to provide input.

As an example, transparency was key to the success of an airport master plan that WSP recently prepared for Billy Bishop Toronto City Airport, where activity grew rapidly over a span of 10 years from less than 100,000 annual passengers to nearly three million in 2019. The airport is located on the lakeshore adjacent to the downtown, in proximity to high-density residential development, community facilities and the city's waterfront park system. As a result, there has been a lot of local opposition to the airport.

At the start of planning process, the planning team initiated a robust stakeholder engagement process that included over 70 meetings held with the general public, community associations, special interest groups, airport operators, government agencies, politicians, and Indigenous communities. This engagement continued throughout the duration of the project.

Valuing the input from all participants, the airport master plan adopted an innovative approach to future airport development that includes a managed growth strategy [MGS], which balances the operational and business objectives of the airport and its operators with community objectives and environmental and

sustainability initiatives. The MGS includes placing caps on annual and peak-hour passenger activity and aircraft movements as well as focusing on environmental initiatives, such as reducing the generation of aircraft ground noise, placing greater emphasis on the use of public transit as the preferred mode of landside access, and converting an existing diesel vehicle ferry to electric.

As a result of these initiatives, PortsToronto, the operator of the airport, was awarded the 2020 ACI North America Environmental Achievement Award.

Planning for infrastructure is a long-term process. How can airports plan effectively given the need to accommodate change more quickly than ever more?

Greg Ballentine: Traditionally, the airport master plan has been considered a roadmap to achieve a vision for the airport while ensuring that short-term infrastructure and business decisions do not compromise long-term objectives. Airport master plans are considered living documents in that they are meant to be updated on a periodic basis to adjust to changes in activity and operational objectives. Flexibility is the key to protecting the long-term vision and accommodating change.

Environmental sustainability, greenhouse-gas reduction, pandemic resilience and climate risk are areas that must now be considered in the master planning and terminal planning processes. We [WSP] are presently undertaking a climate risk study for an airport in Eastern Canada that is examining potential risks associated with climate change. This includes everything from reduced landing approach minimums to the threat of flooding and impacts on building performance. The key is to recognize

potential weaknesses and identify possible mitigation measures. As another example, we are working with a terminal operator to determine how a prolonged pandemic could impact passenger processing and spatial requirements and in turn require adjustments to the terminal expansion's functional program, including provision for increased queuing space, expanded departure holdroom areas and touchless restroom facilities.

Bosco Rodrigues: These points underline the importance of asset and operational adaptability, which should be built into airport master plans. This involves technical and infrastructure flexibility and, just as importantly, airport operator and owner flexibility as well as stakeholder agility. The Red Sea Airport [RSA], currently being built in Saudi Arabia is a recent example of this theory being put into practice. As planners, we direct and guide airports such as the RSA along a pathway from where they are now to where they want to get to.² This journey of transition must address the complex practical realities of airports as businesses and providers of public services and local economic stimulus while minimizing their environmental footprint. Their existing infrastructure, facilities and services are akin to a town or city, with a correspondingly complex array of competing stakeholder needs and requirements. In this way, airports are microcosms of society, with similar challenges and opportunities.

It is important to understand that significant challenges ahead also present opportunities to continue to do what aviation has always done well—stimulate economic growth, facilitate trade and enable tourism—while moving towards carbon neutrality, to achieve net zero. This is where innovative technologies play a vital role, specifically with electric flight and infrastructure, hydrogen fuel cell technology, and sustainable aviation fuel.

Accommodating change and making the most of possibilities requires a reassessment of the current capital-intensive airport business model involving lengthy planning-design construction timescales, towards one that is more dynamic. This shift will enable the delivery of flexible facilities more quickly and more cost effectively; it will also result in a less disposable aviation culture that strives towards a progressive strategy, one that re-purposes and recycles infrastructure, reducing embodied carbon in the process while also accommodating change to support new opportunities for non-aeronautical revenue generation.

I believe aviation can draw inspiration from other industries where there have been efforts to decrease embodied carbon. The automotive industry, for example, has gone from one of the worst environmental offenders to one of the leading recycling innovators. Some furniture and lifestyle manufacturers and service providers have also embraced the circular economy, revolutionizing their whole procurement process and supply chain and how they respond to rapid change relative to societal norms.

Arnie Rosenberg: Out-of-the-box thinking will certainly be tomorrow's business trend setter. Considering environmental and energy strategies is a must-do in today's aviation long-term planning process. Electric-powered and hydrogen-fueled aircraft will be the next reality check that airports and the aviation industry will have to address. Where and how will airports get the electric capacity to fuel their aircraft power needs? How will hydrogen generation and the movement of its components be accommodated? Strategic thinking for long-term planning must also include the new generation of eVTOL [electric vertical take-off and landing] aircraft and hypersonic, high-altitude aircraft that we have glimpses of today.

² The Red Sea Development Company, The Project wsp.com

John van Woensel: The planning process will likely benefit from including the power supply utility in defining future power needs to accommodate electric aircraft and vehicles. To build resilience into the planning process, airports can consider redundant power supply, perhaps dual power, to terminals from substations that are spread far apart so they are not all affected by a flood or other unexpected event; they would be fed from different power supplies in case one of them goes off-line. Another possibility is connecting different forms of power in a microgrid.

Considering the challenges discussed here, what new capabilities will shape successful airport planning teams?

Bosco Rodrigues: Airport planning professionals themselves will draw from many disciplines and skills to address the complex challenges airports are facing now and will face. In the near future, I expect airport planning teams to consist of professionals with multidisciplinary backgrounds—reflecting the need for dynamic and imaginative solutions—and empathy and emotional intelligence, which cannot easily be replaced by artificial intelligence.

Arnie Rosenberg: As Bosco noted earlier, effective communication, coordination and collaboration will drive problem-solving. Bringing together an array of people, data and technology will position organizations for optimal performance and growth in a sustainable manner. This collaboration advances integrated planning and enables organizations to be agile in response to changing circumstances as they make strategic and tactical decisions. It takes a cohesive team of professionals—planners, architects, engineers, program and construction managers, and cost and risk specialists, among others—to develop master

plans that help airports maintain the positive contributions of aviation while supporting decarbonization and the environment.

John van Woensel: It is also important to point out that we are not saying to include everybody in the plan and that the plan must consider everything. This would be too costly, make the process unwieldy, and take too long to support timely decision-making and movement toward implementation. The real value of experienced planners becomes clear when they work with airport authorities to define the elements that are most important for their particular situation, timeline, and infrastructure decision needs, and then include those things in the process. It is difficult and against the nature of planners to exclude scope, but it is always necessary to make sure the planning assignment remains practical and manageable.

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