Facing the Future: Building a More Resilient Airport Business Model

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FACING THE FUTURE
Building a More Resilient Airport Business Model

Dear Reader

Economic uncertainty continues in many markets around the world, even as broad global economic health metrics steadily improve and many equity markets are at, or near, all-time highs. Economies are slowly emerging from recession, but some more slowly than others – and a few appear to be at risk of re-entering or remaining in recession. Additionally, geopolitical uncertainty has risen unexpectedly in recent years, perhaps contributing to the slower-than-expected rate of economic recovery. In an increasingly connected and globalised world, problems – whether economic, geopolitical, or public health-related – often don’t remain geographically isolated.

Given this environment, businesses, especially those in the most globalised industries such as air transport, should assume unexpected challenges will occur with regularity, and therefore invest in making their organisations more resilient. As a July 2013 Harvard Business Review article¹ put it, ‘Surprises Are the New Normal; Resilience Is the New Skill’.

However, surprise and change isn’t just about risk – it’s also about opportunity. Technological advances are a good example of change that typically offers both. With respect to air travel, several such advances are converging to dramatically improve connections between demand (customers/passengers) and supply (sellers/airports/airlines) including cloud computing, social media, mobile technology, and analytics. They are opening up new ways to improve passenger experience, reduce operating costs, and develop revenue streams. While such technological developments are generally positive, they are also fast moving and complex, and can therefore disrupt existing business models to the extent that there are bound to be both winners and losers.

In this context, we think of business resilience as managing risk smartly while remaining open to new external influences. It involves preparing and organising to anticipate and handle challenges well and to understand and quickly capitalise on new opportunities. It is adopting a mind-set of surprises being the ‘new normal’, and realising that it’s not a question of ‘if’ the unexpected will happen, but rather ‘when?’, ‘what?’, and ‘are we prepared?’. Resilience, then, is strength with flexibility, and focus with situational awareness.

¹ http://blogs.hbr.org/2013/07/surprises-are-the-new-normal-r/
Many airport operators are adapting to this new normal and recognising the need for much greater flexibility, creativity, global awareness, and social awareness in the management of airports. While there are limitations to flexibility in an infrastructure-intensive business, many measures can still be taken to optimise near- and long-term financial performance. For airports, such measures include improved commercial/retail contracts, ‘just-in-time’ and modular capacity expansion, sustainability-influenced design, early trend spotting through ‘big data’ and analytics, targeted airline service incentives, upgraded tools for customer satisfaction measuring and monitoring, IT strategic planning, and sophisticated traffic forecasting and integrated financial modelling tools (i.e., ones which integrate traffic, capital expenditure, operational expenditure, aeronautical revenue, and non-aeronautical revenue) which will support scenario-based and quantitative approaches to business planning and decision-making. Additionally, for many airports, economic regulation will be a critical factor – if not the single most important one – in optimising business performance. Having the understanding, skills, and tools to assess regulatory alternatives will be critical to thoughtfully engaging regulators and negotiating improvements.

The following articles reflect some of our thoughts on how airport managers and investors can address surprises being the new normal and resilience being the new necessary skill. They cover a range of perspectives: embracing new and resilient business models, developing effective strategy, enhancing customer service, investing in sustainability, and assessing investment opportunities in emerging markets such as India and Latin America. They were written by a multidisciplinary group of LeighFisher staff with extensive experience in the aviation industry. We hope you will find them interesting and informative. We also welcome any feedback that you might have, including differing perspectives or new ideas. You can provide this by emailing the authors directly (using the email addresses included at the end of each article) or me at mark.lunsford@leighfisher.com.

Yours sincerely

Mark Lunsford
President
FACING THE FUTURE: Building a More Resilient Airport Business Model

1. Airport Business Resilience: Plan for Uncertainty and Prepare for Change

by Andy Carlisle

In recent years the global economy has been subject to almost unprecedented turbulence which has resulted in a climate of uncertainty. The aviation industry has proved particularly vulnerable to external events such as terrorism, pandemics, and extreme weather. Rapid change in consumer markets and technologies is creating a situation in which businesses should increasingly expect future disruptive factors to challenge ‘business as usual’ models.

While often perceived as an operational issue, resilience is an increasing feature of airport business management, and shapes how business models evolve to meet new challenges. Airlines have become more cost-sensitive; alliances are expanding; many Middle Eastern carriers are aggressively growing; growth is becoming more centred on emerging markets; new aircraft offer market opportunities; and the private sector is taking an increasing role in the global industry. In this context, resilience means managing risk and capitalising on opportunities. It involves preparing and organising for change. No one can predict the future, but certain strategies can build a more resilient business model that can better cope with change. No one wants to think about what might go wrong, but avoiding the issue is not a sustainable strategy.

This article uses three questions to investigate how airports can improve business resilience and better withstand future disruptive factors, external shocks, and market uncertainty:

- What are the business fundamentals of resilience?
- What strategies can management use to improve the resilience of their business?
- What disruptive factors will challenge resilience in the future?

What are the Business Fundamentals of Resilience?

A number of interdependent variables drive airport business performance, as illustrated in Figure 1.

Although traffic – passenger and cargo – is just one element of an airport’s business plan, it directly drives an airport’s revenue and costs, and ultimately influences every part of the business and its operations. Exploring the potential variability of demand enables assessment of the possible impact of such variations on cost, revenue, and capital investment needs – which in turn influences the

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**Figure 1**

**DRIVERS OF AIRPORT BUSINESS PERFORMANCE**

- Traffic forecasts
- New capacity
- Phasing/size of CapEx
- Expanding and/or opening new facilities

- Costs and revenues
- Volume
- Capacity
- Level of service
- Capital expenditure
- Regulatory requirements
- Concession obligations
- Financial commitments
- Environmental issues
planning of airport facilities and operations.

This provides a foundation for looking at ways to offset the financial impact that results from lower traffic levels, such as revenue enhancement or cost-reduction measures, as illustrated in Figure 2. The range of potential measures available will help to determine the overall risk that can be attributed to a particular business plan forecast. If a future fall in traffic can be offset by cost-reduction measures, then greater confidence can be attributed to the business plan’s profit forecast. However, in contrast to many other businesses, airports have a high proportion of fixed costs – a function of the high level of capital investment involved – and there is thus less opportunity to quickly reduce cost if demand falls.

Similarly, should traffic exceed forecasts, having infrastructure that can readily adapt to higher traffic flows (or a different mix of traffic type) adds confidence, since the ultimate focus for management, investors, and lenders is the deliverability of forecast profits.

The long-term nature of airport planning, and of related decision-making, means that investment decisions are therefore hugely reliant on the assessment of future demand. These decisions have to be made without certainty about what the future holds, but there are nevertheless a number of strategies that airports can adopt to improve business resilience.

What Strategies Can Management Use to Improve the Resilience of Their Business?

Actively Manage and Plan for Traffic Risk

The underlying characteristics of the local airport catchment are the primary factors in demand resilience for most airports. If there is proven demand for specific markets, or routes, then it is reasonable to assume that there will be an airline to provide a corresponding service, and therefore that demand at the airport for these proven markets is more resilient to changes in airline strategy, or individual carriers ceasing operations.

However, airports that have a high level of hub operations (i.e., transfer traffic) from one airline can be more dependent on the strategy of that carrier than airports with a greater spread of carriers, which puts them in a vulnerable position. Unfavourable developments can lead to an almost permanent loss of transfer traffic associated with a dominant carrier, because it is linked to the carrier’s strategy or performance and not just to the local airport catchment – as we have seen at Pittsburgh after the US Airways retrenchment and at Brussels after the Sabena collapse. Brussels Airport took over a decade to return to the same number of passengers it was serving before the Sabena collapse, adopting a proactive route development strategy to develop a more diversified airline mix. Airports with a strong catchment will naturally be more attractive to many carriers and therefore likely to have a more robust position when it comes to negotiating airport charges. If an airport adopts strategies which encourage a greater diversity of airlines to serve it, rather than passively accommodating the business plan of one particular carrier, it can help to reduce its exposure to this kind of risk.

A comprehensive air service marketing strategy, where the airport identifies potential airlines and proactively pitches route forecasts and business cases to them, is a key component of building a more resilient route network at an airport. The principles are the same as for any business aiming to target new customers. Many airlines have very limited internal capacity to research opportunities, so airports that pitch and present a case in ways that are relevant to them (i.e., in terms of route economics, yield,
and projected profitability) have a much higher chance of success. It is also good practice to work with local businesses and tourism bodies in developing the pitch. Glossy brochures alone will not succeed: airlines want to know the business case.

Negotiating long-term airline agreements can also help to provide the climate for more confident investment decisions. Although airlines may choose to break those agreements under certain circumstances, they do provide a framework for longer-term investment planning in which airports work closely with carriers to meet their needs.

Forecasting demand is a critical tool in building resilience into business plans and operational strategies, and in evaluating the viability of a potential airport investment. The key to successful risk management and contingency planning is evaluating how demand is likely to respond in various scenarios other than the ‘business as usual’ case. External shocks – such as extreme weather, airline failure, and terrorist events – are by their nature unpredictable, but from a forecasting perspective, management, investors, and lenders increasingly want to understand how vulnerable any business plan is to such setbacks. In the case of many of the shock events that can happen, experience of them now exists, allowing us to estimate their impact on demand and the likely speed of recovery from them – or, on the other hand, whether any permanent damage may result.

The intent should be to balance the various categories of scenario that can be defined and tested, and to develop a plausible case or series of cases. Part of this process involves accepting that the air transport sector is prone to shocks from one event or another, and hence that stress testing is always advisable.

Some typical stress tests include modelling the following:

- The effect of an economic event or shock:
  - Arising from the demand side (e.g., a recession)
  - Arising from supply side (e.g., an airline failure)
  - Such as a ‘black swan’ event (e.g., terrorism, extreme weather)
- The degree of exposure to a specific carrier
- The reliance on a specific market sector (e.g., transfer activity, business travel, leisure travel)
- The competitive response from other nearby airports, or from alternative transport modes, and the threat that this may pose

Taken together, these provide the framework for an investor or management team to evaluate and quantify the demand risk at the airport, which provides the foundation for developing potential response strategies – measures that can be taken to address or contain future threats. This is especially relevant for master planning or decisions about facility expansion. Understanding the range of risk (and opportunity) helps in deciding how to develop appropriately flexible and adaptable facilities. Such development may increase costs in the short term, but will likely result in positive pay back over the long term.

**Don’t Rely on Regulation – You Can’t Beat the Market**

An airport earns its income from two primary sources:

- Aeronautical fees levied on airlines, passengers, and users
- Commercial activity centred on terminal concessions, car parking, and property

Traditionally airports have relied heavily on fees charged to airlines and passengers. However, influenced by the rise of low-cost carriers around the world, airlines have become more cost-sensitive and more prepared to shift operations to keep their costs competitive. This is especially true if the airport does not serve a strong primary market (such as a capital city or an important business centre), has few carriers serving it, or operates as a hub for a single carrier, thus making it vulnerable as discussed above.

Many airports have their aeronautical charges set by a regulator. There are several different models around the world of how this is implemented, but typically regulation is seen as a way of ensuring that the costs of airport development are, at least in part, borne by its users. Increasingly, however, regulation does not provide a guarantee of income. For example,
the recent regulatory settlement at Heathrow, where a fee decrease in real terms has been set over the next 5 years, has shown that regulators take into account a whole range of factors in setting prices, and that direct capital investment in new airport facilities may not automatically translate into higher fees.

Airline pressure during the decision-making process can lead to less favourable, or delayed, price increases – often as a result of political influence. For example, the theoretical price increases following the development of Terminal 3 at New Delhi – based on a cost-recovery methodology originally enshrined in the legal documentation associated with the concession – did not, in the end, lead to the permitted price rises. Equally, regulator-approved charge increases at Rome were delayed for many years, probably as a result of ministerial concern about the financial viability of Alitalia.

There are many examples of airports around the world where commercial and political pressures mean that they cannot set charges at the approved regulatory level, for fear of losing traffic.

Where airport prices are not regulated, airports do have the freedom to adjust their prices, but decisions are then based almost entirely on market forces. In an ever-more competitive market, this introduces a greater risk of aeronautical revenue coming under price pressure. On the other hand, this freedom provides management with the ability to respond immediately to market conditions through its pricing strategy, which provides a degree of resilience.

There is therefore a growing need for airports to develop a diversified revenue base, and as a result, airports have increasingly focused on developing revenue from commercial activity in order to build greater resilience into their business operations.

**Diversify the Revenue Base**

Airports typically have three main sources of commercial income: (1) terminal concessions or rents, (2) car parking (and in some places car hire), and (3) property. Terminal and parking incomes are directly linked to passenger demand; property tends to be less strongly linked, although passenger demand can be reflective of the strength of the regional economy, which drives the demand for property.

**Concessions:** Within the terminal, the use of minimum guarantees, which provide a minimum concession fee to the airport operator irrespective of performance, can help to mitigate the impact of fluctuating demand on airport income. However, in some cases this can reduce the incentives for a concessionaire, so a balanced perspective is needed. Ultimately it is important to recognise that if demand is weak, then the viability of concessions will be under threat. If businesses are not viable, the airport operator may suffer, regardless of the contract terms or guarantees in place.

Long-term concession agreements can help provide greater security of income. However, this can reduce flexibility or make it difficult to remove a poor performer. It is important that as circumstances change, airports are able to regularly tender their concessions to ensure the commercial offer is attractive to the types of passengers using the airport and capitalises on the commercial potential of new infrastructure. Contracts of over 5 or 10 years significantly reduce the opportunity to react to changing market conditions.

**Car Parking:** Car parking is another key revenue stream directly related to passenger demand. Yield management provides a mechanism for flexibly adjusting prices to maximise revenue, and is one approach used to improve overall income resilience. Rather than seeking to grow revenues purely by meeting demand (which involves significant capital expenditure in parking structures and hence is subject to traffic risk), yield management aims to optimise revenue and address any capacity constraints.

Increasing the range of the car-parking offer, for example valet services and business-oriented products, can help to make the revenue stream less elastic to gross demand by reflecting the propensity to pay of different types of passenger. Business passengers are less sensitive to price and often more interested in such products as valet parking, whereas leisure demand is highly elastic, and far more cost-conscious, especially if there are off-airport alternatives available.
Off-airport parking competition is a significant issue at many airports and can reduce the yields that can be achieved. To meet the off-airport challenge, airports are increasingly using greater product variety, web-based booking, and are working with consolidators.

Property: Given the risks that arise from fluctuations in demand, sourcing new income from activities that are less passenger demand-dependent – such as property development – can also improve the resilience of overall airport income. Passenger demand and property opportunities fluctuate with the economic cycle, so longer-term leases or contracts can help reduce risk. Airports often use ground leases, rather than directly build and market commercial facilities themselves, as such specialist expertise may not be available within the airport company. This reduces exposure and, as in the terminal, they leave building fit-out and leasing responsibilities to the property developers. The ‘airport city’ is the ultimate manifestation of developing income streams that are less related to airport demand.

Unique Revenue Development Opportunities: As with any business, there are situations unique to individual airports that can provide commercial advantage. For example, Dallas/Fort Worth generates revenues from natural gas extraction on some of its land. Las Vegas has slot machines at many of its gates, taking advantage of its gambling constituency. Many airports reflect the inherent characteristics of their passengers in their retail offer – for example, football shirts are big business at Glasgow Airport. Although the specific shops may vary, there is an increasing uniformity in terminal retail around the world. Perhaps one day we will be able to haggle the price in duty free at New Delhi, or a bazaar will be opened at Marrakech.

Other interesting uses of property include a blueberry plantation and golf course adjacent to Bacon County Airport in Georgia, USA; a solar forest at Long Beach, California; and wind turbines on the roof of the airport administration building at Boston-Logan International Airport. However, uniqueness is not always a positive – the car salvage yards and ‘tyre mountains’ that used to ring Brown Field (a small general aviation airport near San Diego) may have earned revenue from land rents, but were a real eyesore.

Deliver a Great Passenger Experience

The interdependencies within the airport business strongly suggest that customer-facing issues need to be addressed. For example, with the move to airside-dominated retail in recent years, simply having a great retail facility is no longer a guarantee of enhanced revenues. If passenger propensity to spend is reduced by the stress of queuing, either at security or within the retail outlet, and the time available to browse the retail offer is reduced as a result, then revenues will be lower. As with so many aspects of the airport business, adopting a holistic perspective can help to build greater resilience into overall airport profitability than can be achieved by looking at individual areas in isolation.

Security is a major bottleneck in many airport terminals. Long queues, excessive delays, and poor customer service at security both exacerbate a passenger’s stress and use up valuable time. The higher the stress, the less likely they are to spend in the airside concessions which they encounter immediately after security. Some counter-intuitive wayfinding are not conducive to high retail spending. If a passenger’s journey through an airport is intuitive and stress-free, and they have good sight of the whole retail offer, they are likely to spend more money. Shops hidden in corners generally don’t trade well, but strategically sited retail anchors can draw passengers to less well-sited adjacent areas, acting as magnets to help drive up revenue in the adjacent stores.

Equally, providing information such as signage or layout plans all helps passengers to better orient themselves. In recent years, the use of smartphone apps has helped airports to overcome some of these issues and optimise revenues within the physical limitations of their terminals. Digital technology is now allowing airports to increase their revenue from advertising, without cluttering the terminal with more and more hoardings.
FACING THE FUTURE: Building a More Resilient Airport Business Model

In February 2012, Budapest Airport had to respond to the collapse of its national carrier, Malév. The response of management provides a case study of how airports can respond to disruptive change and capitalise on the opportunity created from adversity.

In 2011, Budapest handled almost 9 million passengers. Malév was the main carrier, accounting for 37% of the airport’s passengers; it was also the airport’s most important customer, generating almost 50% of its income.

Within just 5 days of Malév ceasing operations, other airlines had taken over 60% of its point-to-point traffic. By the end of 2012, the year-on-year fall in arriving and departing passenger numbers at Budapest Airport was only 4.7%. As Malév used Budapest as its hub, some 1.5 million transfer passengers were lost permanently, but within 5 weeks 80% of the point-to-point traffic had been taken up by other carriers. Although many network carriers ramped up services, it was the low-cost sector – primarily Ryanair and Wizz Air – that took advantage of the Malév collapse.

Budapest Airport initiated a series of coordinated actions to rebuild the traffic base, and mitigate the financial impacts of the Malév collapse.

Traffic Replacement

On the day of the Malév bankruptcy, Wizz Air and Ryanair announced the launch of nearly 40 new routes, recognising the strategic opportunity which had been created by the demise of Malév. This had impacts on other European airports, which quickly adjusted their seasonal schedules to provide airlines with the aircraft capacity to aggressively target the vacant Budapest slots. Network carriers also responded. Within 72 hours of the Malév announcement, Lufthansa and Air Berlin launched new services. During 2012, Aegean Airlines, Brit Air, Transavia, and Blue1 all launched new routes from Budapest, while Ryanair operated 28 routes and Wizz Air launched 10 new daily flights, upping the number of its aircraft based at Budapest from four to six. Many other airlines also reacted to the situation by increasing the frequency of existing flights or expanding their capacity by using larger aircraft to serve Budapest. As a result, load factors improved significantly, but the number of aircraft movements fell by around 23,000.

While management was very proactive in its response to the collapse of Malév, it is also true that many airlines had been anticipating the situation and rapidly adjusted their networks to take full advantage of it. They recognised the strategic opportunity to grab market share, and quickly moved capacity from lesser performing routes.

Budapest Airport’s market share for low-cost carriers increased from 26% in 2011 to 52% in 2012. To meet the new requirements of full-service and low-cost carriers within the confines of a single terminal building, the airport not only developed different service levels but also created separate areas on the apron. Airlines can now choose between different levels of service (with associated differences in cost) that are in line with their needs – for example, the airport has introduced a differentiated gate boarding product.

There are two aspects to note in the Malév collapse. Firstly, the underlying strength of the Budapest market, which was growing strongly before the Malév collapse, was attractive to airlines, and airport activity had been constrained in the years leading up to the crisis by the dominance and financial weakness of Malév. The rebuilding of the traffic base did not significantly dilute aeronautical revenue yields as one might have reasonably expected. Secondly, Budapest Airport had an organised air service marketing team that had prepared for the eventuality of a Malév collapse. It was therefore able to immediately target new carriers and respond rapidly to the opportunities that quickly emerged.

Operational and Infrastructure Efficiencies

Management undertook a number of immediate actions to reduce the direct costs of operations. Firstly, they closed the old Terminal 1 and concentrated all operations at Terminal 2. This not only immediately reduced operating and maintenance costs, but optimised commercial revenue, since T2 included a recently enhanced commercial offer, known as SkyCourt. The retail offer in T2 was then fine-tuned to reflect the new passenger profile. T1 reopened in 2012 as a conference and event venue, providing new commercial opportunities. This highlights the benefits of having infrastructure capacity that is flexible, and that can be adapted to market conditions.
In addition, the airport accelerated a planned cost-reduction programme. Wages were frozen, the headcount was reduced by 25%, and new working practices and shift patterns were introduced. Given that Malév was the main cargo customer, a planned cargo city development was deferred, and instead some existing buildings were refurbished to be let. Recognising the importance of a diversified revenue income, especially with the loss of income from Malév, which had leased various buildings at the airport, planning for the development of a new business park continued.

Taken together, these responses meant that Budapest Airport’s EBITDA fell from €104 million in 2011 to €100 million in 2012, so profitability fell proportionately less than traffic volumes. This demonstrates that in replacing the Malév traffic, the airport had not significantly diluted its yields, and that its aggressive cost control and efficiency measures had mitigated the effects of the inevitable short-term drop in commercial and property income.

The Takeaway

The overall lesson from the Budapest Airport/Malév episode is that airport management had prepared well for the potential collapse of its largest customer. They had analysed its repercussions, understood their business risks, and prepared business contingency plans. They did not simply focus on traffic replacement or emergency cost reduction, but took a series of coordinated actions that ultimately minimised the negative impact on profitability. An interesting question is the extent to which the private ownership and operation of Budapest both allowed – and indeed required – it to plan for and respond to events in the way it did.

Since 2012, traffic has continued to grow at Budapest, and it expects to handle more than 9 million passengers for the first time in 2014 – more than before the Malév collapse. The airport also successfully closed a €1.3 billion refinancing in September 2014, during which the resilience of the airport’s business model was a key focus.

Studies have shown that longer queues at security equate to less revenue, as passengers have less time to shop. The key metric is airside dwell time: time lost getting airside leads directly to lower revenues.

Social media plays an increasing role in airport communication, and provides the opportunity to promote offers and build loyalty with the passenger. There are play areas for children in many airports that help parents to relax, and put them in the right frame of mind to shop.

In summary, investment in the passenger experience is an essential ingredient to developing revenues that are more resilient.

Focus on Operational and Infrastructure Flexibility

Since airports have a high proportion of fixed costs, it can be difficult to respond quickly and effectively to a change in circumstances. A reduction in demand is generally difficult to offset through decommissioning facilities, or reducing staffing levels.

Outsourcing is one tactic that has been used by airports to both reduce their cost exposure and introduce more flexible labour practices and efficiencies. Common examples include contracting for cleaning, security services, and car park management.

Airport operating costs are a function of both demand and infrastructure. Cleaning, heating, and lighting costs are as much determined by the size of the terminal as they are by the number of people using it. This makes it harder to reduce costs quickly, but outsourcing and technological advances are providing potential new ways to better flex operations in line with demand. This is especially relevant at an airport where there is considerable peaking in the airline schedule.

Correctly sizing expansion facilities is one of the most critical commercial decisions airport managements have to make. Given the time that it takes to develop new facilities, and the risk that demand may change considerably during the period of construction, this is especially challenging. Using a modular approach can reduce future risk. Although it may add to the overall costs in the long term, it can improve the resilience of an airport’s profitability to changing market conditions. New developments do not merely solve capacity needs: they can also maximise potential revenue, and retail planning is now more commonly at the heart of terminal planning and design.

Unless concession obligations define otherwise, airports can typically defer investment or maintenance decisions by a few years if market conditions change. Safety demands that maintenance issues cannot be ignored, but in the short term they can be prioritised and managed to offset financial pressures.
FACING THE FUTURE: Building a More Resilient Airport Business Model

What Disruptive Factors Will Challenge Resilience in the Future?

As one of the most globalised industries, air transport is subject to continual change, and there are many potential disruptive factors – some, which we have seen before, will always be with us; some will be brand new and some of these will be completely unexpected. Typically these are considered as downside risks, but resilience is about capitalising on emerging opportunity as much as it is concerned with containing risk.

Airlines

The airline industry is in a state of constant flux. The impact of the low-cost model on short-haul travel over the past 20 years has shown how significant the effects can be. It has provided growth opportunities for many airports, but on the other hand it has brought greater competition between airports, and put pressure on aeronautical revenue. Combined with the introduction of private-sector investment in airports, this has led to a greater business focus and a more commercial mindset.

Looking ahead, there is increasing expectation of the long-haul low-cost model proving viable, as Norwegian and Air Asia X are currently attempting to prove. This, along with the availability of new aircraft models such as the Boeing 787 Dreamliner, could mean that more airports will be able to support direct long-haul services that could trigger both expansion and higher income.

Airlines are aware of their own demand risks and have been improving their own resilience by significantly growing ancillary revenues. These might initially compete with the commercial offer at airports, but in the long term we could see the emergence of a more co-operative approach between airlines and airports which puts passenger experience first and ultimately yields greater income for both airports and airlines.

Competition

In many markets, there is likely to be greater competition from surface modes, especially high-speed rail in Europe. Governments are increasingly seeking to develop high-speed rail services, and – as we saw with the impact that Eurostar has had on London to Paris air traffic – this could materially affect demand on some routes.

Regulation

The passenger experience is likely to continue to become a more important feature of the way airports are regulated. In recent years we have seen this trend worldwide, be it through standards set in public–private partnership (PPP) concession contracts, or through economic regulation, with aeronautical charge levels linked to meeting pre-determined service levels.

This is especially the case in emerging economies, where a key driver of PPP structures is to expand capacity, provide investment for new facilities, leverage international operational expertise, and improve the passenger experience. In view of this, PPP contracts increasingly involve a number of qualitative measures such as minimum level-of-service targets, facility availability, and queue time metrics. Performance is often assessed through passenger surveys, and leads to financial penalties or incentives.

Regulation is therefore expected to focus more on outcomes, not merely on cost recovery. Meeting environmental targets, such as emissions or carbon footprint, can be expected to be incorporated more commonly in the future, as more sophisticated regulatory structures emerge that take a more holistic perspective.

Climate Change

As well as the need to design more resilient infrastructure to withstand increasingly extreme weather, airports will need to become much more aware of their carbon footprint. At first glance this would seem to imply lower or capped traffic growth and thus to constitute a material threat. However, technology advances could enable a reduction in carbon – for example, through the reduction in the transport of products that comes from the growth of online shopping, the installation of smart lighting/heating in terminals, and smart parking to reduce vehicle emissions. Given that a significant part of an airport’s directly controllable carbon emissions come from surface access, measures to reduce this will become an increasing business imperative in order to ensure that the core aeronautical business can still grow. Pressure may grow for greater accessibility to public transport, and an increase in its use could reduce car park revenue. The move to market based measures to meet carbon neutral goals, such as proposed by ICAO, will introduce a further financial dimension to emissions management. Managing rising
demand within a constrained carbon and emission footprint will be a key challenge for the future, and one that new aircraft technology alone, for all the emissions reductions and fuel efficiency increases that it offers, may not solve. Climate change may also present an opportunity for airports – the falling cost of solar panel technology could enable airports to leverage their property portfolios and introduce new income streams.

Security

Ongoing changes in security threats and screening protocols have been one of the biggest disruptive factors in commercial aviation operations, especially after the terrorist attacks in the United States on September 11, 2001. The underlying factors that led to these terrorists attacks still largely remain and aviation still appears to be a favored target. As such, we can expect further changes to screening protocols as threats change and are better understood. Investment in new technology is the obvious response, given ever-tighter constraints on terminal space combined with the commercial, operational, and customer service imperative to keep security queues short. Screening techniques that avoid separately scanning laptops and liquids are already available, and their adoption is likely to expand significantly. For example, IATA’s Smart Security Program (SmartS) has the aim of establishing a faster, more convenient, and less intrusive checkpoint process by early 2020. In the United States, the Transportation Security Administration (TSA) pre-check system for frequent travellers has been successfully deployed at many major airports. The greatest challenge now will be persuading aviation regulators to accept new security technologies and processes, especially in the context of heightened global security threats.

Over the longer term, improvements may mean that less staffing is required which, given that security staff costs are one of the largest single operating cost items at many airports, could materially improve profitability.

Automation has transformed many other industries in the past 20 years; it is hard to envisage that airports will be any exception, and automation of the baggage-handling process in particular offers real opportunities. Most airports still rely on a very traditional, labour-intensive baggage handling and screening operation. Automation and high-speed checked baggage-screening systems hold out the prospect of greater efficiency, reliability and availability, and reduced cost, although the initial investment costs may be high.

New Technology

The advent of the internet was one of the catalysts for the development of the low-cost carrier market, and new technology is increasingly likely to be disruptive to ‘business as usual’. The spread of smartphone technology provides opportunities for enhancing commercial revenues, and social media provides a means whereby airports can engage directly with their passengers in a way they have never hitherto been able to. This looks set to transform the traditional retail experience and (the general overall airport experience), giving airports the prospect of boosting their commercial revenues from a smaller physical footprint. Although this provides an opportunity for smaller airports, it may also allow larger airports to reduce the costs of their terminal operations and logistics support.

Airports enjoy the commercial benefit of a highly captive market, but the way shopping patterns on the high street evolve will translate over time to airports. Virtual shopping is already taking place at airports around the world, with schemes allowing passengers to have purchases delivered to their home or office becoming more widespread. At London Gatwick, passengers can now order goods online using iPads and the supermarket Tesco has established a virtual store so that holidaymakers can have groceries delivered for when they return home. Retailers will become more sophisticated, and the experience more personalised. For example, in the same way that online retailers track buying habits, some retailers have started to ship their products and capture the sale data so that when a customer returns to the store, the staff can immediately see their previous purchases and profile. This growing use of sophisticated retail and passenger profiling techniques means that airports will need to keep pace with the latest trends, technology, and techniques to ensure that the commercial offer is personal, fresh, vibrant, and relevant, so as to deliver future revenue increases.

The Overall Airport Experience

The whole airport experience will always need to reflect changes in consumer taste and expectations, be it from the retail perspective or the way in which passengers move through the airport. While check-in desks have steadily been replaced by self-service kiosks over the past decade, the move to the virtual store has been slower. Business travel will always need to reflect changes in consumer taste and expectations. For example, many business travellers have moved to virtual shopping, where online retailers track buying habits, some retailers have started to ship their products and capture the sale data so that when a customer returns to the store, the staff can immediately see their previous purchases and profile. This growing use of sophisticated retail and passenger profiling techniques means that airports will need to keep pace with the latest trends, technology, and techniques to ensure that the commercial offer is personal, fresh, vibrant, and relevant, so as to deliver future revenue increases.
enhanced convenience for passengers may offset concerns about privacy.

Technology observers believe that wearable computing could redefine how we use and interact with technology and information. Smartphones may have been hogging the innovation spotlight in recent years, but turning up almost unnoticed until very recently has been ‘wearable tech’ – be it Google Glass, smart watches or smart jewellery. Virgin Atlantic recently evaluated Google Glass on its suitability for facilitating the check-in process and improving the personalisation of the customer experience. Over time, the confluence of wearable technology, biometrics, profiling, and automation can potentially provide a more seamless – and highly customised – airport experience for passengers.

**Conclusions**

Airports are typically more resilient businesses than airlines, although the two are closely interconnected. There are few examples of a commercial service airport closing (unless it is being replaced by a new greenfield airport in the same region), whereas there have been many airline bankruptcies, especially in the deregulated era. That in itself creates risk for airports, given an airport’s revenue is vulnerable to traffic fluctuations. However, airports can counteract their vulnerabilities with commercial activity to enhance long-term revenue resilience more effectively than other types of infrastructure.

Privatisation over the past 25 years has brought a greater focus on airports’ financial performance, and short- and longer-term resilience is therefore under much greater scrutiny, particularly in view of the fact that the airline customer base has, historically, been financially fragile. For an investor who is a minority shareholder, resilience is especially important, as they cannot directly effect change. A controlling stake in an airport at least provides the ability to force through change to safeguard investor interests, if the need to do so arises.

Airports already have many resilient features, but contingency planning, risk profiling, and managing dependencies can further enhance resilience. Regular strategic planning exercises can be useful in identifying the future challenges and in developing strategies that can respond to change, and capitalise on opportunity. One cannot predict what lies round the corner, but it is prudent to look ahead in as comprehensive a manner as possible, since to rely on a single strategy, or plan for only one possible future, is inconsistent with enhancing business resilience.

As the future unfolds, airports will need to be, and remain, alert to the rapid changes now taking place on every front. Regulation and business priorities will, increasingly, converge on improving the passenger experience, but within the context of a constrained operating and infrastructure footprint. Managing the risk of market, regulatory, and environmental disruption is one aspect of building resilience. On the positive side, though, new and potentially disruptive technology has the ability to deliver greater profitability from enhanced revenue, passenger experience, processing efficiency, and airport capacity. But in view of the unpredictability, as well as the exciting possibilities, of the future operating environment for airports the world over, both safety and operational resilience priorities demand that they need to be on the leading edge, rather than the bleeding edge, of change.
2. Brazilian Airport Concessions: A Successful Conclusion to Round 2

by Mike Tubridy, Jeesoo Lee, and Dominika Kudyba

With much fanfare and eager anticipation, Brazil successfully completed the second round of its airport concession programme in August 2014. The Round 2 programme – encompassing Rio de Janeiro-Galeão and Belo Horizonte-Confins – was announced in December 2012, when economic conditions were clearly more subdued than during the earlier Round 1 transactions. Brazil’s GDP growth rates had declined, while its Consumer Price Index (inflation) had been on the rise, creating pressure on both the middle class and the working class. Meanwhile, fierce competition among airlines in Brazil led to a continued decrease in domestic airline yields, which reached historic lows. The era of double-digit annual growth in Brazil’s aviation market seemed to have come to an end. Nevertheless, the global airport investment community was undeterred – interest in the two assets was high, as global operators such as Singapore Changi and Ferrovial formed consortia with major Brazilian infrastructure, construction, and engineering companies such as Odebrecht and CCR Group to acquire the airport concession rights.

At the open auction held on 22 November 2013, a consortium consisting of Odebrecht and Singapore’s Changi Airport Group bid R$19 billion (then equivalent to US$8.3 billion) to win the 25-year concession rights to manage and operate Rio de Janeiro-Galeão. At the same time, a consortium comprised of CCR Group and the operators of Zurich Airport and Munich Airport bid R$1.82 billion (US$795 million) and won the 30-year concession for Belo Horizonte-Confins.

On 12 August 2014, 4 months after the signing of the concession agreements in April, responsibility for the two airports was passed into the hands of the winning consortia.

Meanwhile, the Round 1 airports (i.e., São Paulo-Guarulhos, Brasilia, and Campinas-Viracopos) continued with their respective capital expansion plans in preparation for the 2014 Brazil FIFA World Cup:

- The consortium of Invepar and Airports Company South Africa met its contracted deadline to open a brand new terminal at São Paulo-Guarulhos by 11 May 2014. The Star Alliance airlines moved into the new facility. According to published reports, the consortium has invested US$1.3 billion in capital improvements at the airport.

São Paulo-Guarulhos International Airport
In Brasília, the consortium of Engevix and Argentina’s Corporación América also met its deadline of 25 May 2014 to open a new terminal at Brasília International Airport.

The developments at Campinas-Viracopos did not go so smoothly. The consortium of UTC, Triunfo, and France’s Egis missed their pre-World Cup deadline (11 May 2014), and work on a new terminal was partially suspended because of unsafe working conditions. Instead of being available for commercial traffic during the World Cup, the new terminal was restricted to FIFA delegations and for the use of some of the national football teams, who were based locally during the tournament.

While progress on the three airports may not have realised the most optimistic hopes of the government and the nation, progress was nevertheless significant. In fact, many commentators during the World Cup mentioned that infrastructure (and in particular the airports) was in much better shape than they had been led to believe beforehand.

So what’s next for airport PPPs in Brazil? Federal elections have been dominating the Brazilian news of late, but it is anticipated that the success of the first and second rounds of airport concessions in Brazil will stimulate additional rounds. There are 31 airports in Brazil with at least 1 million annual passengers, and 12 airports processing in excess of 5 million annual passengers. Only five of the major airports have been concessioned. Current speculation is that Salvador, Porto Alegre, Recife, Curitiba, Manaus, and Fortaleza are potential candidates for a possible Round 3 of the concession programme.

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3. Emerging Ride-Booking and Car-Sharing Services

by Peter Mandle and Stephanie Box

Technology-driven ride-booking and peer-to-peer car-sharing services are changing the competitive environment for ground transport businesses at airports. Innovative ride-booking and car-sharing services are today offering airport customers ground transport options that were not previously available. These services use mobile internet technologies and peer-to-peer marketplaces to compete with traditional taxi, minicab, shared-ride van, and rental car services. This trend is global, reaching more than 160 cities around the world. Although airline passengers may welcome the new choices, airport operators have found it challenging to ensure passenger safety and security, adhere to evolving regulations being established by city or state regulators, manage terminal building kerbsides, and maintain airport revenues while providing appropriate opportunities for new businesses. This article reviews many of the ride-booking and car-sharing services and looks into their implications for airport operators.

The New Services

Ride-booking and car-sharing services allow customers to arrange transport quickly and easily using a smartphone application, or ‘app’. Simplicity of use, competitive pricing, reliability, and a generally high quality of service have attracted increasing numbers of customers to these services and spurred on their growth – particularly in cities with unreliable or insufficient taxi services.

How does it work? Ride-booking apps typically use smartphone GPS technology to match a customer’s location with the nearest available car. Upon booking a ride, the customer is sent an estimated pick-up time, a description of the arriving vehicle, and an image of the driver. At the customer’s destination, the app can often calculate the fare automatically and charge the customer’s credit card. With some businesses, the fare includes a tip and a surcharge paid to the ride-booking service. Some services allow customers to rate the driver and vehicle, leading to more business for those receiving higher scores; drivers likewise may rate customers. Some ride-booking services (e.g., UberBlack, UberSUV, and Curb) use drivers licensed by local regulatory authorities and commercially licensed minicabs and taxis. Others (such as Lyft, Sidecar, and Uber’s uberX service) do not. Instead, these services allow drivers to use their own personal vehicles which are regulated as Transportation Network Companies (TNCs). While these services may sometimes be referred to as ‘ride sharing’, they differ from conventional carpools and other forms of ride sharing in that the driver is paid a fare or wage based on the time and distance travelled, rather than simply sharing the transport costs with fellow passengers.

Car-sharing businesses serve customers who need a car occasionally but wish to avoid the hassles of car ownership. Services such as Zipcar simplify car rental by replacing counter agents and contract paperwork with websites for making reservations and payments, and by providing

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1 While many jurisdictions in the US (such as California, Chicago, Colorado, and Seattle) have passed new legislation specifically for TNCs (many of which were only approved this summer), in other places (particularly recently in Europe) municipalities are expecting these companies to comply with existing taxi or vehicle-for-hire regulations and are enforcing them as such (leading to vehicle impoundments, fines, and legal action).
membership cards and fobs with embedded electronic chips that lock and unlock the vehicles. For companies such as Zipcar, membership and partial day rentals are core concepts. They serve primarily urban residents and students, offering low hourly rates (in addition to the membership fee). Some focus on specific geographic markets – Autolib’ in France, cambio in Germany and Belgium. Some are sponsored by vehicle manufacturers: Daimler sponsors Car2Go; BMW and Sixt jointly sponsor DriveNow, which rents electric-powered BMW products. With Avis’s 2013 acquisition of Zipcar and the introduction of similar services by Hertz and Enterprise Holdings, car-sharing services are increasingly available at airports in the United States and Europe.

While traditional car-sharing services have existed in Europe for many years, newer services such as RelayRides and Getaround follow a peer-to-peer model, allowing owners to rent out their own personal vehicles instead of using a company fleet. Some of these services, such as FlightCar, specifically cater to airline passengers, picking them up in a comfortable sedan and transporting them to an off-airport lot where their rental car is waiting. RelayRides, which serves a broader market, signed an agreement to provide services at San Francisco International Airport in 2013, allowing airline passengers to park their car at a nearby hotel and have it rented out while they are away, thus earning income from the rental of their car rather than paying to park it. The car owner and the renter ride the free hotel shuttle to and from the airport, so unlike competing off-airport parking and rental car services, RelayRides does not have to operate any courtesy vehicle.

The Challenges

Ride-booking and peer-to-peer car-sharing services present challenges for airport operators seeking to ensure passenger safety and security, manage kerbsides efficiently, and maintain important revenue streams.

Identifying unmarked vehicles. Some ride-booking services (such as Lyft, Sidecar, and uberX) use privately owned vehicles. If the drivers of these cars remove their identifying signs or symbols (e.g., Lyft’s pink moustache), the vehicles cannot be easily spotted by airport enforcement staff and might evade required permits, fees, and other airport regulations pertaining to commercial vehicles. In response, some airports are requiring that all ride-booking vehicles display ‘trade dress’ or company identification.

Checking the driver’s background. To ensure the safety of their customers, airports and other regulators wish to confirm that the drivers of ride-booking services have a safe driving history and do not hold a criminal record. Some regulators rely upon background checks performed by a third-party screening company, while others require that the check be performed by a government agency. As part of the background check, some agencies require drivers to be fingerprinted in order to verify the driver’s identity, but currently most agencies do not.

Insuring the airport and its passengers. To protect the airport and its passengers, some jurisdictions require that ride-booking services maintain liability insurance for all drivers during four stages: (1) when a driver has logged onto the company’s app but has not yet been assigned a passenger, (2) when the driver has accepted a passenger but the customer is not yet in the car, (3) when the driver is transporting the customer to their destination and, (4) prior to or after transporting the customer, but while the driver is still on airport property. The insurance coverage typically varies during each of these increments, with the highest coverage required while the customer is in the vehicle, but some airports require the same insurance amounts at all times that the driver is on airport property. Other key challenges related to insurance include ensuring that the company-provided insurance is the primary coverage (rather than the driver’s personal insurance), and that the airport is named as an additional party on the insurance policy.

Ensuring payment of airport fees. Several airports have proposed, or now require, that ride-booking companies pay fees calculated according to the number of times their vehicles enter and exit an airport, or cross a ‘geofence’ (an electronic border around an airport) that has been jointly established by an airport and a ride-booking company. These fees are collected directly from the ride-booking company, which typically adds the cost to the fares paid by customers travelling to and from the airport.
Some airport operators allow ride-booking services to ‘self-report’ airport trips and transactions, relying on the company’s computerised records for supporting documentation. These records are subject to audits to ensure compliance.

Addressing implications for taxi concession contracts. In most cities, only taxis can serve on-demand/walk-up requests, while minicab customers are required to make prior reservations. However, with the advent of smartphones and the increased popularity of ride-booking services, there is less distinction between on-demand and pre-reserved service. This is because a trip may be booked only minutes before pick-up but may still be considered ‘pre-reserved’. This evolution may affect the value of exclusive concession contracts awarded to on-demand taxi and shared-ride providers, and the amount of future taxi company concession bids. The distinction is expected to continue to blur as ride-booking services continue to introduce shared-ride service and other products.

Preserving the operational integrity of the landside area. Existing taxi and limousine providers are likely to question the requirement to pay airport fees and comply with airport rules if they are losing customers to competitors who offer lower fares, do not pay required airport fees, do not comply with airport rules, and do not use commercially licensed vehicles or drivers. To mitigate this challenge, many airports are developing new rules, regulations, and permits that address these ride-booking services.

Accommodating ride-booking services. Some airports have allocated ride-booking services specific kerbside areas, while others require that the ride-booking services share kerb space with private vehicles and wait for customers while parked in staging areas, or off-airport locations. Some airports, working with the ride-booking companies, discourage for-hire vehicles without prearranged fares from parking on the airport (or in other prohibited areas) by precluding them from being available in the company app.

The ability of airport staff to regulate the use of specific kerbside or waiting areas depends on the ride-booking services displaying distinctive trade dress or other identifying markings. Unlike drivers of traditional minicabs and chauffeur cars, the drivers of ride-booking services prefer not to enter the terminal to greet passengers, or to park in airport parking structures.

Conclusions

Now is the time for airports to rethink and redesign their car-hire and taxi concession strategies. Car-sharing and ride-booking services are now available worldwide. Demand for such services is rapidly expanding from city centres and suburbs to include travel to and from airports, and they are likely to be offered at every major airport in the near future.

The emergence of such services poses a risk to traditional airport revenue streams, but, equally, presents an opportunity to establish new transport solutions that meet the changing needs of passengers. Airport management should move early to capture this business, prevent an unwelcome underground market from evolving at the airport, and counteract the risk to revenues arising from car-hire companies, taxi concessions, and car parking. Partnering with the right car-sharing and ride-booking businesses will be important. These business models are innovative and in their infancy at airports, and among the many entities that have emerged there will be winners and losers, with a certain amount of consolidation to be expected. Long-term concessions should, therefore, be treated with caution. Airports should consider partnering with the entities that best fit the needs of their passengers and their surface access choices. Aligned with the right providers, the airport can position itself as convenient, modern-thinking, passenger-centric, and looking after the end-to-end journey.

Airport operators will need to work with local regulators to accommodate the new players in the marketplace alongside the traditional providers. Most importantly, the process of engagement will need to be open and transparent, and subject to local and airport regulations, with everyone paying their fair share of airport costs.
4. Sustainability Return on Investment Becomes Part of Airport Business Modelling

by Ryan Burke

Airport management decisions on investments in environmental sustainability projects are difficult to make due to the lack of integration between financial and environmental factors. A sustainability return on investment analysis unites these impacts, presenting a more strategic framework for decision-making. LeighFisher has developed a ‘Sustainability Return on Investment Calculator’ to help airport operators achieve better environmental results at lower financial expense.

Evaluating Environmental Sustainability Investments

For airport operators, sustainability encompasses a wide variety of environmental issues, concerning, for example, energy, water, and greenhouse gases (GHGs). With so many environmental fronts, deciding which resource to reduce first and which projects should be implemented in what order is challenging. Prioritisation difficulties stem from the fact that projected returns of sustainability investments are often opaque. Airport operators struggle to evaluate the effectiveness of individual sustainability investments. They readily understand financial goals such as positive cash flow and financial return on investment (ROI), but measurable sustainability goals such as GHG reduction are not well integrated with traditional investment analysis. This lack of integration between environmental and financial metrics reinforces the misperception that sustainability investment should target environmental benefits over a solid financial return. Such thinking puts sustainability at an immediate disadvantage, as airports are primarily operated with financial and operational objectives in mind – particularly the case for those airports that are owned and operated by the private sector.

Sustainability investments, as with any prudent investment decision, require justification to ensure that scarce capital will be spent efficiently. In the absence of the ability to translate GHGs (or other important environmental issues) into the language of finance, airport operators have difficulty understanding how sustainability is strategically aligned with the airport’s financial mission, and deciding how capital can be allocated efficiently to that end. Sustainability investment methodologies are needed in order to explain how an investment returns both environmental and financial benefits, demonstrating that equal weight is given to both the balance sheet and the physical environment when evaluating a potential investment.

Sustainability Return on Investment Captures Financial and Environmental Performance

One metric that addresses the inherent difficulties associated with determining efficiency and prioritisation of sustainability projects is the ‘sustainability return on investment’ (S-ROI). Calculating S-ROI can give airport operators confidence that a sustainability investment uses capital efficiently to accomplish its sustainability goals.

S-ROI – a single number expressed in currency per resource unit avoided – is calculated as follows:

$$S\text{-ROI} = \frac{\text{Financial Net Present Value (NPV) of a project}}{\text{Total resources avoided during a project’s lifetime}}$$
that are likely to occur over the life of the project. For example, if a solar panel system produced 1 megawatt (MW) of electricity per year, offsetting the purchase of grid electricity, and had an estimated useful life of 35 years, the upper bound of total resources avoided would be 35 MW. However, the typical solar panel output degrades about 0.5% a year, so a more accurate estimate would be 32 MW over 35 years. Appropriately adjusting the avoided resources over the life of the project provides a more accurate representation of the investment’s impact, especially when there is degradation in the performance of the project’s physical components.

S-ROI provides insights such as:

1. If a project has a negative NPV from a purely financial perspective, how effective is the project at increasing sustainability per dollar spent, and what is the cost per tonne of CO₂e (carbon dioxide equivalent) avoided?

2. If a project has a positive NPV, how much financial benefit does the airport derive while improving its sustainability?

Boiling down the efficiency of a sustainability investment to one number makes it easy for an airport operator to have confidence that a project is sound, prudent, and able to meet investment scrutiny. Airport operators can use the S-ROI metric to communicate to their organisation and community stakeholders how well capital is being used to pursue sustainability.

The Sustainability ROI Calculator Is Comprehensive

Many airport operators do not have established methodologies and tools for calculating and evaluating the efficiency of a menu of different sustainability investments. Leigh Fisher’s Sustainability ROI Calculator (SRoIC) was designed with these needs in mind. It is an Excel®-based tool that calculates the S-ROI of investment projects by combining financial and environmental metrics. The SRoIC calculates and uses the NPV of a potential capital investment and the total resources avoided to determine the S-ROI metric. It helps airport operators to save time by calculating both the financial and environmental returns of an investment together, meaning that two separate analyses are not necessary.

The SRoIC can convert all resources avoided into tonne(s) of GHG emissions (CO₂e) avoided. This is critical in order to compare sustainability investment options that reduce different resources. Without a common unit, the individual elements of an investment menu – comprising, for example, electric fleet airport vehicles, compostable waste collection, and water conservation projects – can be difficult to compare.

In this context, ‘resources’ are physical quantities such as water, electricity, natural gas, or gallons of fuel that are targeted for reduced consumption by a sustainability investment.

Traditional financial ROI considers the net incremental cash flows generated by a project in relation to the invested capital and the riskiness of the investment, thereby evaluating its financial attractiveness. Higher discount rates are applied to riskier projects. Financial ROI is used primarily when comparing a number of potential investment alternatives.

S-ROI, on the other hand, evaluates the investment’s efficiency in reducing resource consumption (energy, water, etc.) or environmental pollution (GHGs) on a dollar-per-dollar (or applicable currency) basis after upfront investment, and incremental annual costs and savings, are considered against the baseline scenario. It calculates the financial cost or benefit of avoiding one unit of resource consumption or environmental pollution. Total resources avoided over a project’s lifetime are calculated by multiplying the resources avoided per year by the useful life of the project, and adjusting for any changes that are likely to occur over the life of the project. For example, if a solar panel system produced 1 megawatt (MW) of electricity per year, offsetting the purchase of grid electricity, and had an estimated useful life of 35 years, the upper bound of total resources avoided would be 35 MW. However, the typical solar panel output degrades about 0.5% a year, so a more accurate estimate would be 32 MW over 35 years. Appropriately adjusting the avoided resources over the life of the project provides a more accurate representation of the investment’s impact, especially when there is degradation in the performance of the project’s physical components.

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CO₂e is a measure of carbon dioxide (CO₂) equivalent and is used to normalise emissions from GHGs other than carbon dioxide, in terms of CO₂.
is completed on any inputs and assumptions used in the SRoIC. It is not a ‘total cost of ownership’ model in the traditional sense – those require extensive assumptions. It was built with the aims of greater flexibility and simplicity. The simplicity of the tool allows any airport staff member, not just environmental or financial experts, to analyse and assess potential projects. Airport operators typically have limited resources available in-house for data collection, and for analysis and development of sustainability projects. The SRoIC was developed with these constraints in mind, and delivers simple-to-understand, data-driven results. Moreover, the calculator does not require detailed estimates or growth factors, only rough estimates (in fact, the inflation rate can be set as a default for select growth rates).

Understanding Cost of Avoidance to Maximise Sustainability Investment Returns

Sustainability investments are often not financially positive (i.e., they often yield a negative NPV), yet they still warrant consideration based on their other benefits. In this case, the airport operator needs to determine if the cost of avoidance can be justified before making the investment. For context, the European Union’s Emissions Trading System (EU ETS) sets a market price of avoiding 1 tonne of CO₂e among covered polluters. Assuming a price per tonne of CO₂e of US$8 (approximately the current level), if an airport determines that a specific capital investment could lead to a reduction in its GHG footprint at a cost of US$5 per tonne of CO₂e not emitted, then the investment would be justified because the airport could reduce GHG emissions at a lower cost by implementing the project than by purchasing carbon offsets on the open market. In fact, any project with a cost of avoidance less than US$8 would be justifiable. Nevertheless, it would still need to be determined that the upfront cost of

An indirect benefit of the tool is that it can motivate an airport’s finance and environmental departments to work more closely together. Both disciplines are invaluable in making an airport more sustainable. When completing the data collection, evaluation, and selection stages of an S-ROI analysis, each department comes to fully recognise the importance of the other.
Following from the previous example, the same airport is considering three water conservation technologies: waterless urinals, low-flow toilets, and grey water infrastructure (i.e., infrastructure to take wastewater generated from hand washing basins, recycle it on-site, and use it for toilet flushing and landscape irrigation). However, the airport operator only has budget for one investment per year over the next 3 years. After all financial costs and savings are considered over the useful life of the investments, the waterless urinals are projected to have an S-ROI of minus US$0.004 per gallon of water avoided; low-flow toilets an S-ROI of positive US$0.008 per gallon; and grey water infrastructure an S-ROI of minus US$0.001 per gallon. The airport operator should, therefore, choose to implement low-flow toilets first because it is NPV-positive. Every gallon of water avoided saves the airport US$0.008 on an NPV basis after taking into account the initial investment of the low-flow toilets. The grey water infrastructure would be recommended second because it has a lower cost of avoidance compared to the waterless urinals. Finally, the airport operator might either reject the waterless urinals because the cost of avoidance is too high com-
pared to the other two projects, or go ahead with the project because the cost of avoidance is acceptable given the airport operator’s desire to pursue a water-reduction strategy, with financial considerations being less important in this instance.

When planning sustainability investments, it is important to note that sustainability technology is continually becoming more affordable and effective. While the waterless urinal project initially had an S-ROI of minus US$0.004 per gallon avoided, its S-ROI might be improved to minus US$0.002 (or even become positive) over the course of a few years because of technology improvements. S-ROI analyses are not static, and therefore should always be revisited whenever underlying data and assumptions change. This is especially true when considering capital projects over a number of years.

When evaluating sustainability investments, more than just the S-ROI needs to be considered. It is not simply a case of choosing the investment with the best S-ROI metric. Other factors to consider include the initial investment in absolute (not just relative) terms, and whether the airport has the funding sources available; the absolute (not just relative) resources avoided by a given project; and political issues, such as whether there is support for the project among the relevant stakeholders.

**Sustainability Continues to Progress Beyond the Environmental Realm**

Sustainability has expanded from being a topic solely related to the environment to now being applied across the entire enterprise. Developing a tool to integrate the environmental impacts of business operations into the language of finance and accountancy provides organisations with a more complete view of the true costs and benefits (which are not restricted to the financial ones) of their activities, enabling a superior understanding of current opportunities and future risks, and giving them the ability to achieve better environmental results at less financial expense.

A wide range of for-profit and non-profit organisations are actively developing methodologies and approaches that measure and value environmental and financial data in an integrated way. S-ROI is just one of them, yet it offers powerful insights that help airports to more efficiently allocate capital to the many sustainability challenges that they, and our broader society, face. LeighFisher has already used the SROI to identify NPV-positive and relatively inexpensive sustainability investments that can result in large reductions in environmental impacts. These investments often come at relatively little upfront cost compared to larger, more expensive infrastructure projects.

**ABOUT THE AUTHOR**

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AIRPORTS throughout Latin America are bursting at the seams, and the growth is becoming increasingly difficult to manage. The situation is not likely to improve in the near term! Passenger traffic growth throughout Latin America has grown by leaps and bounds since the 1990s, and has rebounded strongly since a brief interruption in the aftermath of the global recession. Boeing estimates that airlines will need 2,950 new airplanes to serve the region by 2033. Although some of these are destined to replace retiring aircraft, more than 70% will be for incremental fleet expansion – a large increase in less than 20 years.

This rapid growth has put significant pressure on many airports throughout the region, as they were not originally situated or designed for modern-day air traffic volumes. Short-term capital improvements can temporarily mask the swelling capacity crunch, but ultimately the long-term solution to this growing conundrum is to plan and build new airports (also known as ‘greenfield’ airports). Consequently, throughout Latin America, many communities are responding to the growth with plans for the development of greenfield airports. Brazil’s Secretariat of Civil Aviation is planning new airports in Porto Alegre and Natal. Planning and design is also underway for a completely new international airport to replace the existing Mexico City Benito Juárez International Airport – the primary international gateway airport to Mexico. Quito, the capital of Ecuador, opened a brand new international airport in February 2013 which replaced the constrained airport in downtown Quito. Similarly, the city of Guayaquil, Ecuador, is now addressing its future aviation needs by planning its own greenfield airport.

**Guayaquil and Its Existing Airport**

Guayaquil is the largest city in Ecuador, with a metropolitan region population around 2.5 million. It is also the country’s business capital. More than two decades ago, the city began implementing multiple urbanisation projects and, as a result, was named a ‘Model City of Human Development and Governance’ by the United Nations.

Guayaquil is home to Ecuador’s largest seaport and is one of Latin America’s 10 busiest ports. The port prospered as a result of its geographic advantage, providing direct access to the Pacific Ocean and proximity to the Panama Canal. It handles the largest share of Ecuador’s total import and export cargo, and port traffic is forecast to grow significantly along with the regional economy.

The current airport serving Guayaquil – José Joaquín de Olmedo International Airport – connects Guayaquil to many major cities around the world. The airport is one of the country’s two international gateways (the other being Quito), as well as the only commercial service airport serving the greater Guayaquil metropolitan region. It is a primary hub for LAN Ecuador (the airport’s dominant carrier) and a secondary hub for AeroGal and TAME (Ecuador’s national flag carrier). Air service is offered to destinations in North and Latin America, and to Europe (Amsterdam and Madrid). Similarly to the sea port, the airport has a geographic advantage related to further expansion of its network. It is situated less than 8 hours flying time from most cities in the Americas as
shown in Figure 1, which combined with its substantial local economy and travel demand makes it a plausible connecting hub for traffic between North, Central, and South America.

The existing airport is located approximately 5 kilometres north of downtown Guayaquil, along the Guayas River, and has limited room for expansion. The site is surrounded by dense commercial and residential development, as shown in Figure 2. The facilities include a relatively new 52,000-square-metre passenger terminal with 10 contact gates for domestic and international passengers, a 2,790-metre runway, a cargo complex, and general aviation facilities.

The operational excellence of the existing Guayaquil Airport is internationally recognised. The airport was named the best airport in Latin America in 2008 and 2009 by BusinessWeek. In 2013, Airports Council International (ACI) selected the airport as the best airport in Latin America and the second best airport in the 2 million to 5 million annual passenger category. In the preceding 5 years, the airport’s excellence was repeatedly recognised by ACI, resulting in Guayaquil’s induction into the ACI Director General’s ‘Roll of Excellence’ in September 2012, in recognition of its top-5 rank in ACI’s Airport Service Quality Programme for five consecutive years. Guayaquil International Airport is the first and only airport in Latin America to be inducted.

In 2000, Guayaquil’s current mayor, Jaime Nebot, was elected on a platform to boost trade and tourism through the development of multiple infrastructure projects. His efforts paid off – there was rapid growth in trade and tourism in Guayaquil, which has also led to burgeoning demand for aviation services – both passenger and cargo. The airport’s passenger totals grew from approximately 2 million in 2003 to over 4 million annually today, an average annual increase of 9%. A higher
share of the growth was observed for domestic traffic which increased at average annual rate of 12% over the same period, compared to 5% for international passengers.

Growth in aviation activity is expected to continue as the regional economy strengthens. Ecuador’s gross domestic product is projected to increase about 2.7% annually up to 2041, according to estimates provided by Banco Central del Ecuador and internationally recognised organisations such as Global Insight and the International Monetary Fund.

According to aviation activity forecasts prepared by LeighFisher (see Figure 3), annual passenger totals for the Guayaquil region are forecast to be more than 30 million by 2053, when measured on an ‘unconstrained’ basis (i.e., supposing that airport facilities are sufficient to accommodate the entire underlying demand for aviation services). The existing airport is rapidly approaching capacity, and opportunities for growth on the present airport site are limited. According to LeighFisher’s activity forecasts, the airport is expected to reach capacity before 2020. The current airport – even with its reputation for operational excellence, and application of an assortment of ‘band aid’ capital improvements to prolong its useful life – is incapable of accommodating Guayaquil’s demand for aviation services in the medium term, let alone the long term.

**Tackling the Political and Technical Challenges**

The Airport Authority of Guayaquil (AAG), the Municipality of Guayaquil’s entity responsible for managing the concession at the existing airport, responded to the constraints at the existing facility with plans to develop a new airport. The AAG recognised the challenges and tackled them systematically. The first major challenge was to select an area compatible with airport use that could also facilitate the creation of a multimodal gateway in proximity to Guayaquil. The second challenge was to acquire the necessary land from the current landowners. After years of effort, the AAG acquired over 2,000 hectares of contiguous property with direct highway and port access in Daular, an area approximately 30 kilometres from downtown Guayaquil. The Daular site and its surrounding area have limited development today, and the new airport is expected to catalyse commercial development, taking advantage of the multimodal synergies.

The AAG tackled the political challenges through regular dialogue with the mayor of Guayaquil, key constituents, and stakeholders, eventually garnering strong support at the local level. The community of Guayaquil, through the efforts of both the mayor and the CEO of the AAG, is now fully behind this new initiative. In spring of 2014, the mayor officially unveiled the new airport plans and announced that the new airport at Daular would open for service by 2024.

**The Development Plan**

Preliminary plans for the new airport, prepared by LeighFisher, incorporate modularity and flexibility as key elements. Passenger safety and convenience have always been paramount when planning and designing airports. But ‘right-sizing’ facilities for the future is of equal importance, and is increasingly difficult due in large part to technological advances in passenger and baggage processing. Assumptions typically used to quantify terminal requirements are becoming outdated as a result of more widespread adoption of new technology (e.g., self-service kiosks) and changing security screening requirements and safety regulations associated with passenger and baggage processing.

The ultimate development plan allows for the construction of three independent runways. The terminal complex will be designed to ultimately accommodate more than 50 aircraft parking positions.

On opening day, the new airport will have the capacity to accommodate approximately 15 million annual passengers. The primary components...
of the initial phase of the project include two parallel runways, the longest being 4,100 metres, which can accommodate aircraft with flight ranges able to serve most European and North American destinations. To ensure additional flexibility, a wide terminal apron envelope of over 1,700 metres between parallel runways with a modular central terminal core processor is proposed.

**The Business Case**

Greenfield airports require major capital investment, and the new Guayaquil airport is no exception. LeighFisher estimated that the initial Phase 1 development (to opening day) will cost about US$1 billion in today’s money, with a further US$1 billion in capital spending over the following 30 years.

The AAG expects to retain a concessionaire to develop, manage, and operate the new airport, as it has done for the existing airport since 2003. The concessionaire would contribute approximately 70% of the total Phase 1 investment, while the AAG itself would contribute the rest. The Municipality of Guayaquil had the foresight many years ago to recognise that significant investment would likely be needed in new airport facilities. The AAG has been reserving the majority of the annual concession fees paid by the concessionaire at the existing airport in a trust fund set aside for this purpose. With a current balance of more than US$100 million, and annual contributions of more than US$20 million, up to US$300 million is expected to be available to the AAG to invest in the initial phase of the new airport. It will be a true public–private partnership.

A further key element in the financial viability of the new airport is expected to be enhanced non-aeronautical revenue streams. Beyond the significant increase in terminal retail and duty-free spend associated with new and expanded retail facilities (compared to the existing airport), and revenue enhancements driven by increased passenger throughput, the AAG would expect the new airport concessionaire also to develop commercial land over time on tracts of airport property set aside for commercial purposes, such as an airport city. (See Figure 4.)

The combination of anticipated growth in aviation demand and efficiency of the development plan combine to produce a compelling business case. That is, the various stakeholders will benefit more from development than from a status quo or constrained operating environment.

In addition to the financial benefits of the new airport, this project is also expected to generate extensive economic benefits to the Guayaquil region in the form of jobs and economic stimulus. It was estimated that the new airport at Daular will generate US$1.2 billion annually in direct, indirect, and induced economic activity for the region.
Figure 4

LEIGHFISHER’S CONCEPTUAL LAND USE PLAN

Legend:
- Airport property line
- Airfield
- Passenger terminal
- Access and parking
- Commercial development
- Off-airport areas subject to potential zoning and height restrictions
- Military
- Aviation support

LeighFisher Conceptual Plan: The Ultimate Concept for the New Daular Airport
The New Airport – Next Steps in the Process

The Guayaquil region continues to display encouraging economic growth, and aviation is critical to stimulating further growth. While plans are still underway, the AAG expects to select a private partner to develop the new airport within the next 18 months. Given the ambitious timetable for developing the new facility, the AAG hopes to have a concessionaire under contract and ready to start work at Daular by 2016.

The new airport will be built and operated under the terms of a new long-term concession agreement. The concessionaire at the existing airport will retain operational responsibility for the existing airport until the end of its concession contract in 2024 – about the time that the new airport is expected to be open for service. These are exciting times for the AAG, as it manages its current assets and plans for its new home in Daular.

ABOUT THE AUTHORS

Mike Tubridy, a Director in LeighFisher’s Washington DC office, led the facilities work on our master plan project for the new airport in Guayaquil. He can be reached at michael.tubridy@leighfisher.com. Tom Walsh, a Director in our San Francisco office, led the business planning efforts for the new airport. He can be reached at tom.walsh@leighfisher.com.
6. The Development of Mumbai’s Second Airport: The ‘Deal Of The Year’ or ‘Irrational Exuberance’?

by Satyaki Raghunath

Since the early 2000s, the Indian aviation sector has registered double-digit growth year upon year in most years. Nationwide air passenger totals grew from 42 million passengers per annum (mppa) to 145 mppa between 2000 and 2010, equating to a compounded annual growth rate (CAGR) of approximately 13%.

Passenger totals have grown at more than 1.5 times the rate of Indian gross domestic product between 2003 and 2011 (with only a brief interruption during the global financial crisis in 2008–10). The long-term prospects for growth remain positive owing to the underlying rapid growth in the economy, and a recent change in the national government, the nation’s new leaders being viewed as more favourably disposed to the private sector. Airlines in India have placed orders for over 400 new aircraft to be delivered over the next 5 to 10 years. Even if fewer aircraft are ultimately delivered, the growth in locally-based aircraft will lead to greater demand for airport capacity over that period. As a result, airport modernisation has been and continues to be in the news in India, with some very interesting results. The main Indian airports are shown on Figure 1.

The Mumbai Region and the Existing Airport

The Mumbai Metropolitan Region (MMR) is one the biggest urban agglomerations in the world, with a population of approximately 22 million, according to Demographia. The region is currently served by a single airport, Chhatrapati Shivaji International Airport (CSIA) or Mumbai International Airport, which is the second busiest airport in India. CSIA serves as the primary international and domestic gateway to the western part of India. Mumbai also has political and economic significance, being the financial capital of the nation.

CSIA comprises approximately 600 hectares (ha), of which approximately 20% to 30% is encroached by surrounding neighbourhoods. The main features of the airport are:

- Two dependent runways, running east–west (Runway 09-27) and northwest–southeast (Runway 14-32), with the domestic terminal complex located on the northwest side of the airport, and the international terminal complex on the northeast side of the airport.
• Aircraft maintenance areas and air cargo facilities, located to the east of Runway 14-32 and south of Runway 09-27, and to the west of the existing International Terminal Complex.

An overview of CSIA is shown on Figure 2.

There were opportunities in the mid-1990s for Mumbai and New Delhi to become international connecting hub airports in the Asian region. However, for various reasons the chance was missed, and Singapore and Dubai are now the two pre-eminent hubs for international traffic to and from India, as shown in Figure 3, with other major Asian gateway airports (such as Seoul-Incheon, Tokyo, Beijing, Shanghai, Hong Kong, and Kuala Lumpur) serving as secondary hubs with respect to Indian traffic.

Given India’s large population, the emergence of low-cost carriers, the purchase of new aircraft by Indian airlines, and the continuing growth of the Indian middle class, there is now an urgent need to upgrade the airport infrastructure to enable Greater Mumbai and New Delhi to join the ranks of the other major financial and economic centres in Asia as significant regional hubs – which is achievable if the airports are developed intelligently, with the provision of adequate capacity to meet short- and long-term demand.

CSIA handled around 32 million passengers in India’s fiscal year 2014 (the year to 31 March 2014), accounting for about 20% of the nation’s total passenger traffic.

Owing to the fact that CSIA is likely to reach its ultimate capacity in the next 5 to 7 years, the government of India has in principle approved the development of a second airport to serve the Mumbai region, to be located in Navi Mumbai. It is expected that CSIA will continue operating even when the new airport is fully functional.

The Proposed Navi Mumbai International Airport

The proposed Navi Mumbai International Airport (NMIA) is being promoted by the City and Industrial Development Corporation of Maharashtra Limited (CIDCO) to meet long-term demand in the MMR. It is expected to cater for an ultimate capacity of 60 mppa and to be developed over four phases. The site for NMIA is located along National Highway No. 4B near Panvel in the geographical centre of Navi Mumbai, a distance of approximately 35 kilometres from the existing CSIA in Mumbai, as shown in Figure 4. NMIA is expected to be accessible through the existing Mankhurd–Belapur–Panvel commuter rail corridor, and eventually accessed by the Mumbai Trans Harbour Link.

NMIA is expected to be developed on a build–operate–own–transfer basis, as a public–private partnership (PPP) project with 74% equity available to the winning consortium. The remaining 26% is expected to remain with a government-owned/nominated entity that includes CIDCO. This is the same way that the initial airport concessions in India...
were structured – the concession agreements mandating the development of new greenfield airports in Bangalore and Hyderabad, and the concession agreements involving the redevelopment of New Delhi’s airport, as well as CSIA.

Mumbai International Airport Limited (MIAL), the operator of CSIA, will have the right of first refusal on any new airport that is developed within 150 kilometres of CSIA (which would include Navi Mumbai), provided its proposed offer is within 10% of the highest financial bid for the development of the new airport. GVK, an Indian infrastructure giant, is the lead member of the MIAL consortium.

NMIA will be developed over an area of 1,160 ha, as outlined in Figure 5, and is expected to have two independent parallel runways. However, significant upgrades to surface transport links and infrastructure are required for the airport to be a viable option for travellers in the Mumbai region.

Land acquisition for parts of the airport site have not been completely resolved, and site constraints such as surrounding hills (and therefore approaches to the runways) and a small river located on the airport site need to be addressed.

NMIA is expected to be developed in four phases, with an estimated first phase investment of almost Indian Rupees (INR) 10,000 crores (US$1.6 billion at current exchange rates) to cater for 10 million passengers per annum. According to CIDCO, the project sponsors, the ultimate investment is expected to be approximately INR15,000 crores (US$2.4 billion) to cater to an ultimate capacity of 60 million passengers per annum, as shown in Figure 6.

Phase 1 of the project is expected to be undertaken between 2015 and 2020, with the ultimate build-out being accomplished by 2030. As with many things in India, however, the
actual development cost is likely to exceed the budget, and the project development period will in all likelihood be extended.

**Project Risks and Challenges**

Despite the attractiveness of the Indian economy in general, and the Mumbai region’s market potential in particular, there are significant challenges for investors in this project to overcome. This huge greenfield development faces a range of risks and challenges – some in common with other greenfield airport projects, and some that are unique to Mumbai and India.

Even in cases with no airport competition – where a new airport is being built to replace an old one – the risks are high, and include:

- Uncertainty over construction and operational costs
- Site availability issues
- High dependency on other parties (such as government agencies not related to the airport) to provide connecting infrastructure and planning, as well as legislative support, to make it work, and
- Front-end loading of costs for entirely new assets, with the costs needing to be spread over a given traffic base; generally this implies that prices (charges) need to be higher than those at the old facility if costs are to be fully recovered

Additionally, there are significant risks specific to secondary airports within a catchment area where the existing (primary) airport will continue to operate. These risks include:

- The existing main airport probably has the best location relative to the centres of population.
- The immediate catchment area of the new airport may be inferior.
- The main airport benefits from established access and support infrastructure (roads, rail, hotels etc.).
- The strong network advantages of the existing airport make it better for passengers and airlines.
- The existing airport with established assets has overcome front-end loading (i.e., it is older, and many of the assets will have been depreciated to a certain extent), and enjoys economies of scale, implying that the level of charges and prices needed to achieve cost recovery will be lower.

Specifically with regard to Navi Mumbai, the four main areas which present risks to be overcome if the NMIA project is to be a success for both the government and the concessionaire are:

- Traffic distribution
- The regulatory framework for airport charges
- CapEx and level of service, and
- Landside access and connectivity

**Traffic Distribution**

While – according to multiple forecasts prepared by MIAL and other government and private agencies – unconstrained aviation demand in the Mumbai region is likely to be well in excess of 150 million passengers per annum in the long term, this traffic will be split between CSIA and NMIA.

Investors will need a clear picture of traffic allocation rules between CSIA and NMIA in advance of the bidding process. The Ministry of Civil Aviation (MoCA) must clearly outline whether market forces are going to direct the traffic split between the two airports; or whether they are going to advise on or stipulate the traffic allocation, and provide explicit traffic distribution rules. In the absence of specific traffic distribution rules, traffic build-up at NMIA is likely to be slower, and cash flow generated at NMIA for investors delayed, because most of the airlines serving Mumbai and the travelling public (apart from those living near NMIA) will continue to gravitate towards the existing airport.

**The Regulatory Framework for Airport Charges**

From an economic regulatory perspective also, the development of NMIA poses significant challenges to investors. At the time of bidding for the Indian airport concessions between 2000 and 2005, the Indian government gave clear signals to investors that a hybrid-till approach would be applied. This approach was clearly stated in the respective state support agreements (SSAs), and included a provision that all income from property should be excluded from the regulatory till (all non-aeronautical non-transfer assets as defined by the SSA).

Investor expectations were informed by these commitments, and the revenue-share percentages bid by the winning consortia were calculated on this basis especially for CSIA and Indira Gandhi International Airport (New Delhi). However, recent regulatory developments have indicated that a single-till approach is the preferred option of the Airports Economic Regulatory Authority (AERA), the Indian airport regulator (see www.aera.gov.in).

In the case of NMIA, there are a number of reasons why a dual-till approach, or at least a hybrid-till approach, should be considered:

- Given the level of investment required over the coming years at NMIA (including investment beyond the first phase), it is essential to ensure that investor expectations are met and that investors have a clear conviction that their investment will be fairly remunerated, given the inherent upfront risks involved – especially with a greenfield airport asset in a competitive environment.
• NMIA needs to be developed urgently given the capacity constraints in the MMR. This is recognised by the Indian government in its policy on airport infrastructure. Similarly, AERA’s duties under its enabling AERA Act (of 2008) include first and foremost that, in determining tariffs, AERA must consider ‘the capital expenditure incurred and timely investment in improvement of airport facilities’. Promoting infrastructure development should therefore be regarded as a key priority, particularly in the current situation in which underlying charges have been historically low (before the most recent capacity infusion at Mumbai and Delhi) and infrastructure has been regarded as inadequate in terms of both quality and capacity.

• One of the key reasons stated by AERA in adopting a single-till approach to airport regulation in India was the lack of competition for airports in India’s metropolitan regions – in other words the danger of monopoly pricing. NMIA in particular has the reverse problem – one of having to plan, design, develop, and build a greenfield airport that will compete with an established airport (CSIA).

• Investors are interested principally in the certainty, or predictability, of cash flows from regulatory decisions as well as the near-term levels of those cash flows. Cash flows which are dependent on the individual decisions of regulators on flexing up the cost of capital at successive regulatory reviews are less predictable, and therefore less likely to incentivise further investment.

• In the specific case of NMIA, investors would be asked to invest almost US$2.5 billion without seeing a return on their investment for many years, given how the economics of greenfield airports typically work, especially in a market where there is competition (i.e., the presence of CSIA). Given this reality, a dual- or hybrid-till approach would significantly enhance the attractiveness of the project for investors.

• Significant project risks with respect to traffic and ground access corridors exist in the case of NMIA, and the absence of government guarantees on these issues adds to financial uncertainty.

In short, the introduction of a single-till regulatory regime for a greenfield airport in a competitive environment such as NMIA could result in concession holders being unreasonably worse off as a result of the final regulatory framework, in a way which would invalidate the assumptions behind their bids for those concessions.

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**Figure 7**
PROPOSED PHASING OF NMIA, WITH PHASES SHOWING REQUISITE INCREMENTAL INFRASTRUCTURE

<table>
<thead>
<tr>
<th>Phase 1/10 mppa capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Runway</td>
</tr>
<tr>
<td>Associated airfield infrastructure</td>
</tr>
<tr>
<td>Commercial apron – approx. 356,000 sq. metres</td>
</tr>
<tr>
<td>Passenger terminal – approx. 86,000 sq. metres</td>
</tr>
<tr>
<td>Contact stands – 15</td>
</tr>
<tr>
<td>Remote stands – 5</td>
</tr>
<tr>
<td>ATC tower</td>
</tr>
<tr>
<td>General aviation (GA) apron 6,000 sq. metres</td>
</tr>
<tr>
<td>Aircraft rescue and fire-fighting facility</td>
</tr>
<tr>
<td>Cargo warehouse – approx. 33,000 sq. metres</td>
</tr>
<tr>
<td>Maintenance facilities – approx. 80,000 sq. metres</td>
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<tr>
<td>Phase 1 cost – approx. US$1.5-1.6 billion</td>
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<tr>
<th>Phase 2/25 mppa capacity</th>
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<tbody>
<tr>
<td>South Runway</td>
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<tr>
<td>Associated airfield infrastructure</td>
</tr>
<tr>
<td>Commercial apron – 300,000 sq. metres</td>
</tr>
<tr>
<td>Passenger terminal – approx. 80,000 sq. metres</td>
</tr>
<tr>
<td>Contact stands – 20</td>
</tr>
<tr>
<td>Remote stands – 5</td>
</tr>
<tr>
<td>Phase 2 cost – approx. US$170 million</td>
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<tr>
<th>Phase 3/45 mppa capacity</th>
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<tbody>
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<td>Commercial apron – approx. 422,000 sq. metres</td>
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<tr>
<td>Passenger terminal – approx. 123,000 sq. metres</td>
</tr>
<tr>
<td>Contact stands – 30</td>
</tr>
<tr>
<td>Remote stands – 8</td>
</tr>
<tr>
<td>GA apron – approx. 9,100 sq. metres</td>
</tr>
<tr>
<td>Phase 3 cost – approx. US$506 million</td>
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<table>
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<tr>
<th>Phase 4/60 mppa capacity</th>
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<tbody>
<tr>
<td>Commercial apron – approx. 150,000 sq. metres</td>
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<tr>
<td>Passenger terminal – approx. 50,000 sq. metres</td>
</tr>
<tr>
<td>Contact stands – 12</td>
</tr>
<tr>
<td>Remote stands – 6</td>
</tr>
<tr>
<td>GA apron – approx. 9,000 sq. metres</td>
</tr>
<tr>
<td>Phase 4 cost – approx. US$226 million</td>
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Source: CIDCO
CapEx and Level of Service

Airport modernisation and development in India has generally been challenging in terms of balancing government and passenger expectations of quality of infrastructure, and of level of service (LoS), with the level of charges. There have been particular challenges at Bangalore, Mumbai, and Delhi with respect to providing new infrastructure, and finding ways and means to finance the construction of additional capacity.

CIDCO has outlined a phased development plan with a CapEx investment profile spread over four phases, as described in Figure 7 (and summarised in Figure 6).

Given the challenges outlined earlier of operating a new greenfield airport in competition with an existing airport, the concessionaire will need to have flexibility in developing both the CapEx investment profile and specific projects based on market needs and on negotiations with stakeholders, rather than having a list of mandatory projects specified in advance by the government. The associated LoS and service quality requirements (SQRs) criteria will also need to be clearly defined on the basis of market needs, with the ability for it to evolve over time.

Landside Access and Connectivity

One of the major challenges for the development of the new airport at Navi Mumbai will be access to the facility. Current access to the site is via National Highway No. 4B near Panvel in the geographical centre of Navi Mumbai, at a distance of approximately 35 kilometres from the existing CSIA in Mumbai. NMIA is also expected to be accessible through the existing Mankhurd–Belapur–Panvel commuter rail corridor from Khadreshwar Railway Station.

While the State and local governments have been working hard to ensure accelerated development of access to the site, there has not been much progress to date. It is clear that until the planned Mumbai Trans Harbour Link bridge between Navi Mumbai and Mumbai itself is constructed, the site will be a drive of approximately 3 hours from most parts of Greater Mumbai and the main population centres. In the absence of effective surface access and connectivity to the new airport, air traffic growth will be slower than forecast and airlines will be less likely to select the new facility over the existing airport.

Conclusions

While the need for additional airport capacity to serve the Mumbai region is well documented, the undoubted traffic potential of the new airport at Navi Mumbai could be constrained by the ‘scattergun’ approach which has thus far been used in thinking through the project’s viability.

To mitigate such challenges, the following approaches could be beneficial:

• Consider traffic distribution rules for the MMR
• Ensure good ground access (by rail and road) from the opening day to the new airport from key areas in Mumbai, involving multiple modes of public transport (metro, bus, suburban rail)
• Consider a system-wide approach to regulation for the MMR, and allow system returns (although there might be significant challenges to this approach, given the current concession agreement at CSIA)
• Explore regulatory options with the concessionaires and other stakeholders to ensure that a viable approach can be found for operating the new airport in line with investor expectations

The Indian government will need to take up these issues urgently to facilitate their desire to provide the airport capacity to meet Mumbai’s metropolitan demand through the next two decades.

In the absence of meaningful discussions with stakeholders and a viable plan to address these challenges, the NMIA project runs the risk of either not attracting the major international investors/operators that one would expect to see for a project of this magnitude and importance, or of creating a ‘white elephant’ that would inevitably result in failure. If that happens, the NMIA project will tragically end up as yet another statistic in the already long list of Indian infrastructure projects that were touted as being ‘the next great thing’ but fell by the wayside.

ABOUT THE AUTHOR

Satyaki Raghunath, a LeighFisher Director, has led LeighFisher’s projects for Indian clients for the last 8 years. Satyaki can be reached at satyaki.raghunath@leighfisher.com.
In addition to the Navi Mumbai greenfield airport development, there are several other significant airport transactions ongoing or expected in the near future: They include the following:

**Kansai and Itami, Osaka, Japan:** New Kansai International Airport Company (NKIAC) was formed in 2012 with the objective of operating Kansai International Airport and Osaka International Airport (Itami), which serve the Osaka area of central Japan. In July 2014, NKIAC initiated the process of selecting a ‘private business operator’ (partner) to operate the two airports for a period of 45 years through to 2060, in a transaction expected to be worth over US$7 billion. According to recent schedules published by NKIAC, statements of interest from private operators are expected to be received in October 2014, with selection of the preferred bidder in June 2015, and a transaction close date in late 2015.

**Mexico City:** In September 2014, the government of Mexico announced that a new airport would be built to serve Mexico City. It will replace the existing Benito Juarez International Airport, which is expected to reach its capacity of 32.5 million passengers a year by 2020. The new airport, to be built at a cost of over US$9 billion, will accommodate up to 120 million passengers annually and is expected to be up and running by 2020. Initial seed funding for the project is expected to be made available from the proceeds of a debt issue backed by passenger service charges at the existing airport.

**Toulouse, France:** The French government has tasked the body responsible for the French state’s investments, Agence des Participations de l’État, to undertake a sale process for Toulouse-Blagnac Airport. The state currently owns 60% of the airport and proposes to sell up to 49.99% of its shares. The Toulouse Chamber of Commerce and Industry owns another 25%, with the rest held by three local authorities: Midi-Pyrénées Region, Department of Haute-Garonne and the Urban Community of Greater Toulouse, each owning a 5% stake. The government has invited the Chamber of Commerce to sell some of its shares as part of the process, if it wishes to do so. The sale process was launched in September 2014, final bids are due in mid November, and financial close is expected before the end of 2014. If successful, the sale may prompt further airport privatisations in France during 2015.
Santiago, Chile: A concession process has been initiated for the rights to develop, manage, and operate the landside area (including terminal facilities) at the Arturo Merino Benítez Airport in Santiago for a period of 20 years. This is a re-bid of the existing concession agreement which is expiring soon. Airport passenger throughput is currently about 15 million annually, and growing strongly. The development of a major new terminal is expected to be the centrepiece of the capital programme during the concession period.

Kingston, Jamaica: The Government of Jamaica plans to grant a long-term concession of the Norman Manley International Airport in Kingston, the national capital. The airport currently serves approximately 1.5 million passengers annually, and the transaction process kicked off under the auspices of the International Finance Corporation with investor conferences in July 2014. Expressions of Interest were received in July 2014 and requests for pre-qualification are expected to be issued soon. Short-listed (i.e., qualified) bidders will then be asked to submit proposals. The target date for closing the transaction has not been published yet, but it’s likely to be no sooner than the summer or fall of 2015.

Kastelli, Crete: This PPP project is based on the design, construction, financing, operation, and maintenance of the new Heraklion International Airport on Crete, and the design, construction, and financing of its connecting road infrastructure. The new international airport will be adjacent to the existing military airport at Kastelli, in Heraklion, Crete. It will replace the existing airport of Heraklion, which has reached its peak capacity, handling 5.9 million passengers in 2013. A 35-year concession is proposed. A tender process originally started in 2010, but the economic difficulties in Greece caused the process to be cancelled before final bids were submitted. The process was relaunched in spring of 2014, final bids are due in November 2014, and award and financial close is expected in 2015. These transactions – and some others being mooted that are in a more formative stage – run the gamut of airport size, airport role, and geographic region. Amongst them is likely to be something to interest most classes of airport investor. As is usually the case in the airport investment world, the next few years will be both interesting and challenging, while holding the promise of great reward.

**ABOUT THE AUTHOR**

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