SUCCESSFUL AIRPORTS RELY ON INFRASTRUCTURE LIFECYCLE MANAGEMENT

WHITEPAPER
Airport infrastructure plays a vital role in the economic growth and sustainability of a city, region or country. It stimulates commerce and is a key catalyst in promoting regions as a tourist attraction and business destination. Airports are hubs for large volumes of cargo, further promoting commerce and a range of industries. In many ways the word ‘airport’ is a misnomer: they are better described as an aerotropolis.

Building and maintaining an aerotropolis is a major, multi-year undertaking. During any new construction project, capacity increase or upgrade, thousands of direct and indirect jobs are created. Indeed, whole regions can find themselves supported by a large, international airport.

Airports are undoubtedly complex and consist of a diverse set of infrastructures, with multiple interrelationships. Rail and road connections are required to bring passengers and cargo in and out; retail space is required to maximize revenue and provide leisure activities to travelers; communications networks are needed to support increasing levels of mobility in the workforce; and hotels are needed to support journeys. In many ways, an airport and its surroundings are a city in a city, with an economy of its own.

That’s why coordinating planning, investment, construction and maintenance underpins the transformational nature of any aerotropolis.
Although the growth in air travel in specific locations correlates with regional GDP growth, a number of factors drive global investment in airport infrastructure.

The steady economic recovery in parts of the world since the 2008/9 economic crisis has seen an increase in year-on-year cargo volumes. Growth in developing regions like Latin America, the Middle East and the Asia Pacific regions, has resulted in an uplift in passenger numbers in areas which have previously not used air transportation on such a large scale. As a result, existing airports are investing in extending their capacity to deal with these increases and to future-proof themselves against further growth, while new airports are constructed where the current capacity has become inadequate or as an economic stimulus.

Rapid advances in aviation technology, such as improvements in air traffic control systems or aircraft size (the Airbus A380 for instance), are also forcing airports to adapt current infrastructures. Then there are customer-facing ICT advances, like online booking and check-in, new security systems and free WiFi, all of which require a significant re-allocation of space.

Despite this burst of investment, the rise of the low-cost carrier has also forced airports to be more cost effective in their operations. Lowering airport tax per passenger is an important component in contributing to the affordability of air travel, spreading it to a wider passenger base – and increasing the competition between regional airports.

Another factor that’s driving interest in investment is the fact that over the past decade, airport revenue models have shifted. A significant portion of airport revenue now comes from retail and real-estate portfolios in addition to the traditional aeronautical services where revenue was generated from landing fees. This focus on continuously improving the operational model brings with it a multitude of business improvement initiatives and projects to be planned, coordinated and implemented.

Perhaps most significantly, in many parts of the world, airports have emerged as a new investment asset class for investors in pension or mutual funds. This trend has shifted ownership of airports from the traditional government-owned and operated model, to a private model. Most airport expansion is now no longer state funded, but must be financed from the airport’s own balance sheet, commercial bank loans, public/private partnership initiatives or other infrastructure investment vehicles. This shift means the cost of capital for such projects is now market-related and thus airport operations must ensure a healthy return to shareholders. Like any other business venture, airport owners need more certainty in the near and medium-term, if they are to determine an acceptable ROI.
CHALLENGES IN AIRPORT INVESTMENT

As of July 2015, the CAPA Centre for Aviation has 2,520 general airport projects on record, in addition to the 340 completely new airports that are to be constructed globally. This represents a capital investment of $597.6 billion in airport infrastructure globally.

But airport investment projects present a number of significant challenges to shareholders, administrators and the project management teams involved.

PICKING PROJECTS – VISIBILITY AND TRACEABILITY

It is critical to ensure visibility and traceability when identifying and selecting projects – and that includes the associated transport infrastructure, such as rail links. Projects can include multiple asset classes and investment types, and will span a number of years. Numerous businesses, implementing agents and infrastructure owners are also involved in the process – all of whom need to ensure that projects are measured against strategic intent, if they are to inform short-, medium- and long-term funding requirements.

At this level, related or dependent projects could be implemented by different investment organizations, but the successful completion of all projects is required to achieve a common objective.

BETTER COLLABORATION

The multiple organizations required during any airport infrastructure project is perfectly illustrated by a recent example from India, where a new build required 1,000 engineers and 30,000 construction workers – all of whom would have come from multiple companies. Different contract formats also drive specific communication and collaboration requirements, which is a significant challenge if manual or paper-based communications are used. Projects can be delayed due to missing or delayed communications, so it is critical to ensure that all project teams are working from a ‘single version of the truth’ to ensure timely action.

ENHANCED DOCUMENT MANAGEMENT

Airport infrastructure projects of course generate massive amounts of documents: drawings, specifications and correspondence. Tracking these items is an enormous task and documents can get lost, which has an impact on proving compliance. All of this requires seamless project controls, especially as there will be multiple claims and variations taking place. In the absence of an electronic system that is able to track changes and provide a solid audit trail, the likelihood of costs rising is significant.

With the large number of consultants, contractors, sub-contractors and suppliers involved, it’s no surprise that the owner’s project team has to manage a high number of commercial agreements. They all attract changes, progress measurements and payment applications, which often have to be administered on a monthly basis. Without full traceability, final invoicing may be disputed and even delayed, causing cash flow concerns for affected parties. Strong financial governance must also be maintained under these circumstances to eliminate possible corrupt practices.

The construction of the new Islamabad airport began in April 2007 and it was scheduled to be completed by 2010 at an initially estimated cost of Rs37bn. Now, its completion is not expected before December 2016 and its construction cost may escalate to Rs95bn.

The Inquiry Committee on the New Benazir Bhutto International Airport Project (NBBIAP) in its report held Civil Aviation Authority’s planning department responsible for the delay and the subsequent escalation of cost from Rs37 billion to Rs66 billion.
IMPROVED CONTRACT MANAGEMENT

Airport construction contracts take many formats, such as Design-build, Construction Manager at Risk and Design-bid-build. In the UK, Middle East, Southern Africa and Australia, the NEC3 contract forms are also now popular for large public infrastructure development projects.

A review of airport projects around the world by PwC highlighted a number of common areas of concern:

- The difficulty of predicting future air travel volumes
- The future mix of airlines
- The size and shape of aircraft
- How technology advances will affect airport operations

These can all be mitigated with proper enterprise project portfolio management systems in place.

SKILLS AND MATERIAL SHORTAGES

Anyone responsible for an airport new build or upgrade also has to face a global skills shortage in various high-knowledge areas, such as air traffic control systems. This is allied to a shortage of some specialist materials and equipment, including global positioning systems and snow clearing gear.

Both of these will impact schedules if they are not identified early and mitigated against in terms of sourcing and supply. This is particularly critical for brownfield airport projects, where on-site storage may be limited and congested traffic flow may combine to cause a shortage of materials at certain times.
CHANGE MANAGEMENT CHALLENGES

As mentioned previously, the sheer scale of airport infrastructure projects encompasses more than runways, aprons, hangers and terminals. New build facilities will need to put in place road and rail links, on top of all of the associated internal retail and leisure facilities. Any existing facilities undergoing upgrades will also— to some degree— need to include these types of assets in any plans. Throughout the project, owners will experience change requests that will be measured in the thousands, all of which will require close management if governance is to be maintained. If activities do go through unapproved workflows and are outside governance, costs will escalate— as will risks.

COMMENTS FROM AN AUDITOR’S REPORT AT A MAJOR INTERNATIONAL AIRPORT PROJECT

1. The audit revealed several weaknesses surrounding the Division’s contracting practices:
2. Contracts awarded at a low price but escalate due to excessive change orders
3. Approval of change orders for work unrelated to the specific contract
4. Lack of a structured change control board
5. Lack of approved change control procedure and process
6. Lack of a change control system
7. No or inadequate record keeping destroys traceability and governance
ENSURING THE FULL INFRASTRUCTURE LIFECYCLE

Best practice focuses on three phases: plan, build and operate. Each phase can be broken down into a number of steps that ensure any project – regardless of size and complexity – is brought in on schedule and budget.

It is perhaps the last phase where full lifecycle management really delivers results. Different people across numerous organizations are responsible for the effective execution of each phase in the infrastructure lifecycle of the modern aerotropolis. Ensuring an effective transition between these phases – moving from build to daily facilities management (ensuring institutional knowledge is retained) – is the secret to delivering full value.

Facility and Asset Lifecycle Management (FALM) solutions ensure that preventative maintenance is carried out to schedule, giving full visibility of all assets so that costs can be controlled. FALM helps owners and operators manage assets end to end, giving them the ability to see how any planned downtime/upgrades of one asset will impact the entire portfolio.

HOW DID A €2.3 BILLION EUROPEAN AIRPORT PROJECT DO IT?

1. Alignment of all contractors on business objectives
2. Effective risk mitigation
3. Early contractor involvement
4. Integrated planning with all parties concerned
5. Cross-team collaboration
6. Tolerance for raising and resolving issues
7. Standard contract format
8. Standard project delivery systems
CONCLUSION

According to the Aberdeen Group*, as travel and transportation organizations attempt to transform their businesses to operate more effectively, the ability to select and deliver projects that meet strategic requirements, and produce ROI over an entire lifecycle, is now imperative.

A failure to do so not only leads to cost and schedule overruns of each individual project but can—in the case of an aerotropolis—negatively impact on the economic growth of an entire region. Project portfolio management solutions are tools that give investors, owners, operators and project teams full visibility into the entire lifecycle – and the biggest chance of success.


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