When airport projects fly off course.

Anthony Morgan

Executive summary
Any major infrastructure project is vulnerable to going over budget, running behind schedule, or experiencing other setbacks. Sometimes the issues can be resolved through negotiations, but often they lead to disputes that require arbitration or result in litigation.

Airport projects unfortunately may fly off course more often than other types of infrastructure construction because they are more complicated and involve more uncertainty.

The stakes can be high: A US$400 million contract for construction of a new runway, breakwater, and terminal at Beirut-Rafic Hariri International Airport ballooned by more than US$100 million because of additional costs the contractor claimed due to delays that put the project more than 19 months behind schedule.

Airport projects are especially complex because they involve a wide variety of stakeholders and revenue sources. Airport developments also are typically very large in scope and have a long timeline from planning to completion, increasing the likelihood of design and other changes along the way. And perhaps most significantly, airport facilities are being built at a volatile time for air travel when it is difficult to predict accurately an airport’s needs 10 years or even five years into the future.

Unlike other capital projects, airport developments tend to be more politically sensitive and attract much more media attention. The media coverage can be primarily local, but may be international because an airport is a city’s gateway to the world, attracting people from across the globe. If a project encounters serious setbacks, widespread media attention can damage the airport’s reputation with potential travellers, retailers, construction and engineering firms, and other interested parties. The negative coverage may even cost a city’s mayor his job in the next election.

But airport owners and developers can mitigate the risk of disruptions and disputes by making provisions for possible adjustments in their contracts, incorporating as much flexibility as possible into their designs, and closely monitoring not only the construction process, but also changes in the airline industry and the outlook for air travel.
With any type of project, the greater the uncertainty about demand and other factors, the greater the risks will be.

**Multiple stakeholders, revenue sources, and regulations**

Building a bridge or parking garage is relatively straightforward, with only a few key stakeholders and a single revenue source. In contrast, an airport construction project typically entails a large variety of stakeholders and multiple revenue sources. When an airport expands, it affects the operations and revenues of the airlines flying into that facility, operators of the car parking and garages, retail shops in the terminals, nearby hotels, and train lines to the airport, among others. In fact, a national airline may be effectively shut down if its home airport isn’t operating.

That greater complexity means that the repercussions can be much more significant when a project runs into trouble and the calculation of the exact impact on the various stakeholders’ revenue more difficult. When an oil pipeline is late, it is relatively straightforward to determine the impact on a refinery’s business. But with an airport expansion delay, the financial loss to airlines, retailers, food caterers, and parking facilities isn’t so clear-cut. How do you determine how much revenue a souvenir shop lost because of a delayed airport project?

Airports also can encounter problems if they were designed without taking into account all of the relevant regulations. In addition to international aviation standards, project managers need to be knowledgeable about national and local regulations. For example, the new airport in Berlin, Germany, was nearing completion when local regulatory authorities said the smoke alarm and evacuation systems didn’t meet code requirements, delaying its opening and requiring additional work.

**The cloudy skies**

With any type of project, the greater the uncertainty about demand and other factors, the greater the risks will be. But the volatility of air transportation is especially intense today, which can make the outlook particularly cloudy and add uncertainty to an already complex project.

During the construction phase, airports may have to adapt to changes in their mix of airlines and the size and shape of jet planes, technological advances that can affect an airport’s operations, and an increase or decline in the number of passengers flying in.

Moreover, a particular airport could suddenly face political instability and see a sharp drop in tourism in the midst of a major expansion. We also have seen how a major devastating event such as the terrorist bombings of the World Trade Center and Pentagon in 2001 and the global financial crisis in 2008 can sharply change air travel patterns and affect airport projects.

Indeed, by the time an airport project is finished, the amount of air travel and passengers’ needs may have changed so much that the number of security lines, parking capacity, or other features of the new facilities are no longer suitable.

For instance, technology allows passengers now to check their baggage online, print out their own luggage tags, and load their bags on a conveyor belt when they arrive at the airport—all without even interacting with an airline employee. As a result, an expansion project may be well under way before an airport owner sees that it needs less physical space for people to queue up and check bags than in the past.

That would then require a terminal redesign in the middle of construction to allocate some of that check-in space to other uses, such as retail shops. Such modifications can result in differences of opinion and disputes between owners and contractors over how much the changes increased costs or delayed completion of the project.

Even more costly and disruptive is a major change in an airport’s roster of airlines. If an airport is being expanded to serve as a hub with many passengers transferring to other flights, it requires a more expensive, sophisticated baggage handling system to transfer people’s luggage. Should the airline that’s intended to transport people to other destinations go bankrupt or be acquired by a competitor, the expansion project is no longer appropriate and money was wasted on such features as the transfer baggage system.

**Emerging markets: opportunities and risks**

With air travel expected to grow fastest in emerging markets, airport construction will increasingly be concentrated in the Middle East, Asia, and other developing areas of the world. While that bodes well for engineering and construction firms, it also may mean more complications and disputes. Growth rates in emerging markets are harder to predict.
than in mature economies, making it that much more difficult to project air travel demand in five or 10 years and design an airport of the proper size with the necessary features.

Moreover, airport operators and contractors in emerging markets don’t have the experience in dealing with risk and the sophisticated knowledge to figure out solutions to problems that their counterparts in Europe and North America enjoy. They also don’t have the established relationships that can often help the parties in an airport construction project avoid problems and resolve disputes more expeditiously. In addition, contractors from developed economies will likely find different construction standards and a looser legal framework in emerging countries.

Cultural differences will also come into play. For instance, project changes may not be viewed as a normal part of the construction process in some inexperienced, emerging countries. As a result, they may not build change control procedures into contracts, leading to disputes that can’t be easily resolved.

Another potential risk factor in the Middle East is the desire to create a landmark design for an airport that has a sort of “wow” factor. Such unique designs may draw attention, but they also are more vulnerable to problems because they’ve never been done before. Contractors may try to price that risk into the contract, but if they don’t get it right, they will try to get their money back by contending that the design was flawed from the start and the problems are the owner’s fault.

### Anticipate change

Scope change is the one sure thing to count on with an airport construction project. So from the outset, airport operators need to plan for the likelihood of needing to make adjustments to the project.

Project owners and contractors should clearly set their expectations and establish communication channels and change procedures. They need to agree up front that there will most likely be changes along the way and that they should be prepared to reassess the business case frequently to determine whether the assumptions behind the project still hold true. Such advance work can go a long way toward preventing major disputes that end up in arbitration or litigation.

It’s best to detail in contracts the governance structure processes and information requirements for dealing with changes and variations. The airport owner shouldn’t be required to carry all the risk and pay for all design changes. The contractor not only would make money from every change, but he also would hold the negotiating power. Instead, owners should consider a “gain share/pain share” approach, which means sharing with contractors both the risks of cost overruns and schedule delays and the financial benefits of finishing under budget. The project owner also might consider withholding part of the budget and establishing a capital reserve to cover the expected but unknown changes, rather than add new charges later.

### How to avoid disputes

To minimize the number of disputes, project managers need to look outward, not just inward. They are used to ensuring that the project comes in on budget, on scope, and on schedule. But with airports, they need to closely monitor the bigger world of airlines and travel to make certain that the project still matches market needs.

Another way to avoid disputes is to expand in smaller increments. While it might be more economical to design an airport expansion to meet expected demand for 10 years down the road rather than just five, that longer time horizon increases the risk of making inaccurate passenger demand forecasts and needing to modify designs during the construction process.

Airport designers also are advised to build in as much flexibility as possible. If they use modular design, they can move or knock down walls to change configurations. Such a simple adjustment could provide more room for baggage claim, for instance, if passenger traffic suddenly rises that space could be taken away from another area, such as duty-free shops. Flexible design also could allow terminals to more quickly add parking slots for planes or make modifications to accommodate larger or smaller planes.

Project managers also should stay on top of the rapid advances in technology to avoid being stuck with outdated systems when the airport project is completed. That’s made

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even more complex by the extensive network of technologies within an airport. So much technical change is possible during an airport construction project that the risks can be quite high and the likelihood of disputes much greater than with other types of infrastructure projects. While a toll road involves some technologies, it’s much less complicated than an airport’s host of technologies, including navigation, radar, baggage management, communication, reservation, and check-in systems.

Finally, it’s usually preferable to build the kind of airport structures that have been done successfully in the past. One-of-a-kind terminals may be visually exciting and add to an airport’s allure, but they also invite a multitude of potential problems and disputes during construction.

**Being prepared for possible disputes**

Information is power. That’s why it’s so important that both airport owners and contractors invest in top-notch information technology systems to collect data about a project that can be used later to support their case in the event of a dispute. Such thorough, easily accessible records can help resolve a conflict more swiftly.

It’s also wise to include in the contract the dispute resolution mechanisms, such as mediation or arbitration, which will be used in case there’s a conflict over changes and increased costs. That way, the parties spend any expense and time on resolving the conflict rather than figuring out the procedure for settling it.

Owners and contractors also may want to select in advance an adviser that can do a thorough quantitative analysis in case of a dispute. When a new airport was being built in Hong Kong, it turned out that the specifications for the terminal’s roof tiles were extremely tight, causing problems with the construction tolerances and requiring reworking. That resulted in a disruption claim against the owner in which the contractor retained an adviser to conduct an extensive analysis to quantify the impact of the tight tolerance on productivity and costs and presented those findings to a mediator for settlement of the claim.

From a cost and time standpoint, it’s clearly better to resolve disputes outside the courtroom. Taking legal action also can raise questions about which nation’s laws apply if the contractors, operators, or financing entities are from outside the airport’s home country.

**Next steps**

Airport operators and engineering and construction firms will no doubt face more, not less change in the air travel business in the coming years. They also will be working increasingly in less developed countries, where disputes are more likely than in mature markets. Consequently, they need to become more flexible and more sophisticated to thrive in this volatile climate. Simply put, the better they can anticipate and plan for changes in air travel demand and shifts within the airline industry, the more likely they are to avoid major adjustments to projects and thorny, costly disputes.

**About the author:** Anthony Morgan leads PwC’s construction dispute resolution practice in EMEA and regularly acts as an independent expert on the project management of large complex capital projects. The capital projects team advises both owners and suppliers on delivery, control and commercial issues that they face in implementing engineering and construction projects.

**Contact:** Anthony Morgan (anthony.j.morgan@uk.pwc.com, +44(0) 20 7213 4178)