PERSPECTIVE

2019

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6 KEY COMPONENTS OF SUCCESSFUL PUBLIC-PRIVATE PARTNERSHIPS

A Rider Levett Bucknall Publication

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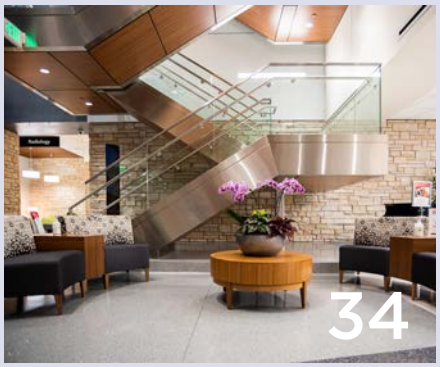

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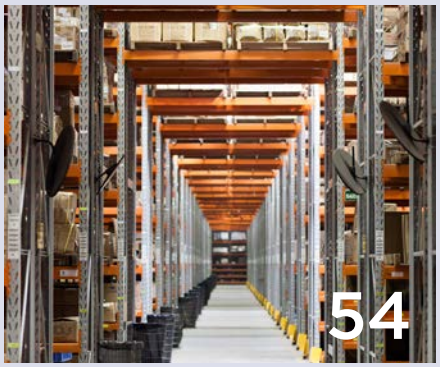

A New Era Dawns
The Industrial Revolution

WELCOME

As we begin 2019, it is my pleasure to welcome you to Rider Levett Bucknall's annual Perspective Magazine, showcasing the insights of our people who comment incisively on the built environment and property consultancy services, including quantity surveying and project management.

In this edition, Perspective addresses a range of industry related topics from forecasting construction expenditure in Hong Kong to healthcare design efficiency, and achieving successful public-private partnerships. We are proud to have a passionate team across the globe with expertise in sports facilities, offices, aviation and rail infrastructure, and data centres, to name but a few of the sectors highlighted in this edition.

Like the many collaborative, internal meetings that have been held at various locations across the globe, discussion papers circulated and staff ideas elicited, this magazine is a testament to our collective strength as we work together with clients to help bring imagination to life.

I express my gratitude to contributors of this edition. I commend this magazine, not just as a record of recent trends, challenges, advancements and innovations to better serve our customers, but as a window into the RLB community we value so greatly.

STEPHEN MEE
RLB GLOBAL CHAIRMAN

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Perspective
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With a network that covers the globe and a heritage spanning over two centuries, Rider Levett Bucknall is a leading independent organization in cost management and quantity surveying, project management and advisory services. Our innovative thinking, global reach, and flawless execution push the boundaries. Taking ambitious projects from an idea to reality.

RLB Rider Levett Bucknall

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INFRASTRUCTURE:

THE MEAT LOAF PROBLEM

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The term 'infrastructure' means different things to different people but for the purposes of this article I will use the Oxford dictionary's definition:

> *"The basic physical and organizational structures and facilities (e.g. buildings, roads, power supplies) needed for the operation of a society or enterprise".*

Remember that as we progress; basic structures and facilities needed for the operation of a society. Not luxuries, not, 'nice to have' but basic and necessary.

The American Society of Civil Engineers' (ASCE) 2017 Infrastructure Report Card found that:

> *"...the national grade for infrastructure remains at a "D+" - the same grade the United States received in 2013 - suggesting only incremental progress was made over the last four years toward restoring America's infrastructure. ASCE evaluated 16 categories of infrastructure in the 2017 Report Card, with grades ranging from a "B" for Rail to a "D-" for Transit."*

Why are these poor ratings persisting in the most advanced economy in the world? According to ASCE, it is simply a failure to invest.

> *The U.S Chamber of Commerce says: "Most Americans agree that our roads, bridges, mass transit systems, air and sea ports, and water infrastructure are critical national assets that drive growth, jobs, safety, and global competitiveness. What we can't seem to agree on is how to pay for badly needed maintenance and repairs.*

> *It's time to stop thinking about infrastructure as a problem, but as an opportunity for bipartisan agreement to invest wisely and carefully in our most critical needs, while eliminating wasteful spending"*

So, what is the problem? From my perspective it is in three parts.

First, the Federal Government has just introduced large tax cuts which in turn has further increased the projected Federal deficit. In a February 18th note to clients, Goldman Sachs warned that federal deficit spending was "entering uncharted territory" thanks to a combination of spending increases on programs such as Social Security and Medicare, and tax cuts. What does this mean for infrastructure? There is no money, or at least not enough money that government wishes to allocate to infrastructure, to address the poor ratings.

Second, the hyped solution to harness private funds through Public Private Partnerships is somewhat hollow. The private sector will not invest in anything without the prospect of a financial return so any project that uses private funds must develop a (profitable) income stream; think toll roads, water and waste water fees, lease back of buildings, etc. So, new freeways providing expedited travel time, some water treatment and some waste water facilities can be monetized. The repair of existing roads, bridges, dams, etc. typically cannot be monetized because Citizen Smith expects that his or her current taxes will cover the cost of basic repairs and maintenance and believes that he or she pays enough in tolls and

taxes already. And, government has to be a partner in any PPP endeavor, so for repair projects what does it bring to the table beyond a crumbling road or bridge?

The recently released White House infrastructure plan calls for a program of $1.5 trillion for repairing and upgrading America's infrastructure. However, (only) $200 billion will come from direct federal spending with the balance expected to come from the equally cash-strapped state and local governments (which are expected to match any federal allocation by at least a four-to-one ratio). It is true that a few projects, mostly transit, will be able to move forward once the federal funds become available because they are already largely funded and simply need a top-up.

Third, and to my mind, the real problem, is that, with fear of an electoral backlash, politicians don't have the will to raise taxes to pay for infrastructure. What taxes could they raise?

- Increase in the 'gas tax', which is problematic for low income earners but might be overcome by either an increase in the minimum wage combined with a further increase in the tax-free threshold.
- A Federal tax on vehicle mileage; which has long been rejected as too much 'big brother'.
- Using the taxes expected to come from the repatriation of overseas profits, although $25 billion requested for the border wall for other infrastructure.
- Increase income tax across the board.
- Introduce a surcharge on top income earners – clearly will not happen after the recent tax cuts.

Of course, there is the option of public debt financing for infrastructure and there is evidence that this will pay for itself fairly quickly by the creation of new jobs[1] but the question is whether Congress has already increased the deficit too much to make further deficit financing politically viable.

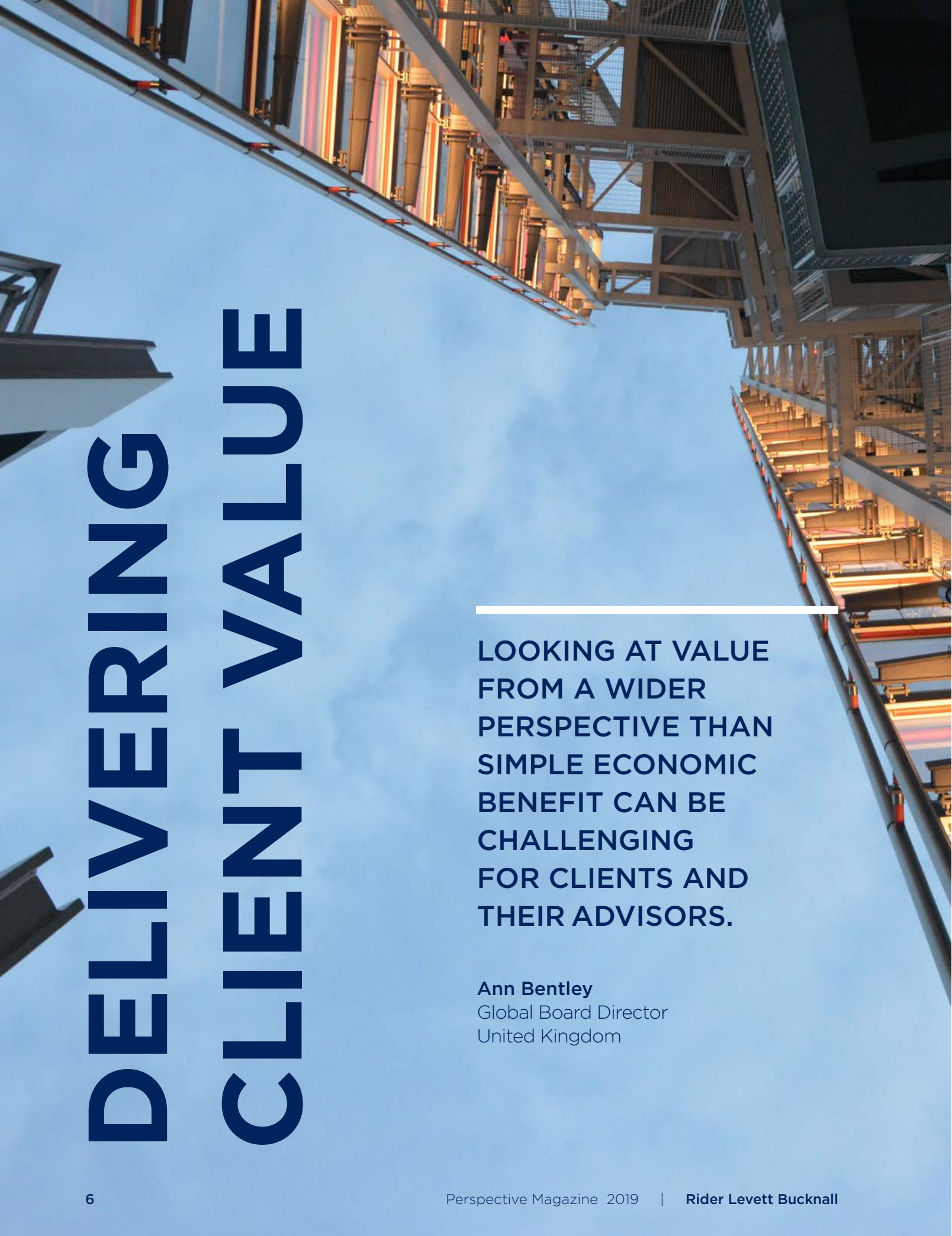
In my opinion, the failure to invest now in infrastructure is a tax on the future of the United States. To paraphrase the Meat Loaf song, when it comes to infrastructure it's a case of;

I want you, I need you
But there ain't no way I'm ever gonna pay for you
Now don't be sad
'Cause two out of three ain't bad.

Julian Anderson, FRICS, CCP
President, North America
Global Board Director

As seen in:
Design Intelligence Quarterly, Q1 2018, "Investing in Infrastructure: The Meatloaf Perspective"

[1] Bivens, Josh. "The Short- and Long-Term Impact of Infrastructure Investments on Employment and Economic Activity in the U.S. Economy." Economic Policy Institute, Economic Policy Institute, 1 July 2014, www.epi.org/publication/impact-of-infrastructure-investments/.



DELIVERING CLIENT VALUE

LOOKING AT VALUE FROM A WIDER PERSPECTIVE THAN SIMPLE ECONOMIC BENEFIT CAN BE CHALLENGING FOR CLIENTS AND THEIR ADVISORS.

Ann Bentley
Global Board Director
United Kingdom

"A CYNIC IS A MAN WHO KNOWS THE PRICE OF EVERYTHING AND THE VALUE OF NOTHING".

- OSCAR WILDE, LADY WINDERMERE'S FAN, 1892

Like most global administrations, the UK Government is committed to delivering "value" in its construction projects. However, the challenge for the sector is how value is defined or measured.

As part of a cross-industry working group – set up to make lasting improvements to construction industry performance - RLB UK has been working on the cost-value challenge. We believe that in order to deliver the maximum benefit from a construction project or programme, much more attention needs to be given to value and how it is assessed and considered in the project initiation and procurement processes.

Our aim is to enable clients to make comparisons between very different options and exercise real choice in how they spend their money. The procurement route and the form of contract are critical to delivering successful projects, but these decisions should be made when the client is fully informed about their value options. All too often we see contract forms and procurement routes pre-determined before the full scope of the project is understood.

Our working group has consulted widely with clients, designers, advisors and constructors and we believe that value decisions fall into two categories.

1. NON-NEGOTIABLES

Typically, these might include:

- Legal compliance
- Finite budget limits
- Minimum performance standards to meet the business case
- Back-stop programme
- Supplier/contractor capability to perform the task.

These need very careful consideration from the client; the role of the professional advisor at this stage is to facilitate and challenge. Once these elements are agreed they should become "Pass/Fail" criteria for selecting procurement routes, forms of contract and potential suppliers, with no further scope for interpretation.

2. ELEMENTS THAT COULD BE TRADABLE

For many clients this is a sizeable list and a mistake that both clients and advisors can make is dealing with these elements as if they are also absolutes, when they are often more fluid.
For example:

- Enhanced functionality
- Enhanced asset performance
- Whole-life performance
- Aesthetics
- Innovative or novel solutions
- Ease of construction
- End-user satisfaction
- Social value
- Environmental impact
- Discretionary capital expenditure
- Discretionary operational expenditure
- Programme contingency

In our analysis we found that not only is this theme of tradability rarely developed, but when options are considered the analysis often lacks depth. Too much emphasis is put on individual elements - such as construction cost or aesthetics - with too little effort spent on considering the interaction between elements, such as the relationship between construction cost and social value.

What we commonly see is a qualitative assessment of many of these tradable elements, which makes them impossible to compare. A typical measure of social value is the number of trainee places created and a measure of end-user satisfaction is a score out of 10. More sophisticated appraisals give relative weighting to these qualitative assessments, but we have found that there is little science behind the weighting, very little testing of the claims suppliers make, and no assessment of the cost of meeting these qualitative targets. This ultimately means that most supplier selection comes down to compliant performance for minimum cost.

Yet we have the ability, as expert advisors, to enable our clients to make much more informed decisions. Each client will have a unique set of circumstances which has led them to procure a building or asset. Our objective must be to give clients choices which give them the highest likelihood that the final built asset will address their particular needs.

This is not a simple process – it may take days or even weeks to complete – but using this methodology at the outset of the project will save considerably more time and money during the design and construction process and the lifetime of the asset. The key to making this a meaningful evaluation is to use a consistent metric for measurement – which we believe is money. This gives clients the ability to compare relative cost and value.

The methodology is simple – advisors work with their client to agree:

- key tradable elements for the project – we would advise between 10 and 15
- how and when these will be measured
- the consistent metric (£,$,etc.)

This requires much more lateral thinking and good quality data on the part of the advisor. For example, what is the value of providing trainee places and how much does it add to the cost of the design and construction process? However, much of this value data has been captured by government economists and is readily available. Other values will have to be drawn out of the client through facilitation or benchmarking against other similar projects. In this way the client and advisors can build a framework for the project. A few examples are given below.

	Cost	Value
Minimum compliant project	Estimated capital cost	Business case value
Social value	Actual cost of provision	Savings to tax payer, value to society
Whole life performance	Estimated cost of provision	Reduced cost of running the asset
Enhanced functionality	Estimated cost of provision	Higher rental value
Enhanced aesthetic	Estimated cost of provision	Prestige value to client

By incentivising the creation of value, or the maintenance of value at a lower cost, this methodology has been used successfully to draw together and align the whole project team to deliver the optimum solution. On programmes of work where this has been done, clients have seen significant increases in value added and reductions in capital cost. Perhaps it's time in our business to take heed of Oscar Wilde's words, it doesn't pay to be a cynic.

Ann Bentley
Global Board Director
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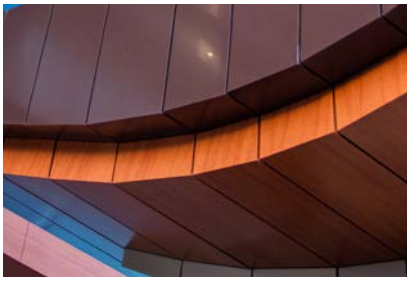


Creating a vibrant intersection of global and local knowledge

The ambitious collaboration between Ove Arup & Partners, Hong Kong Ltd. and, Henning Larsen Architects gave fruit to this iconic landmark which celebrates humanity. Incorporating elements of local nature, culture, and climate, the architecture reflects the desire to create a truly Filipino building which gives back to the city with generous public spaces.

RLB Philippines is providing pre- onstruction services on the ICONE Tower which climbs to a total height of 275 meters and spans 36 floors. The building will contain a museum, observatory, conference hall, dining facility, and office space. It is expected to be completed in 2021.

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SUSTAINABLE DESIGN AND ITS COST:

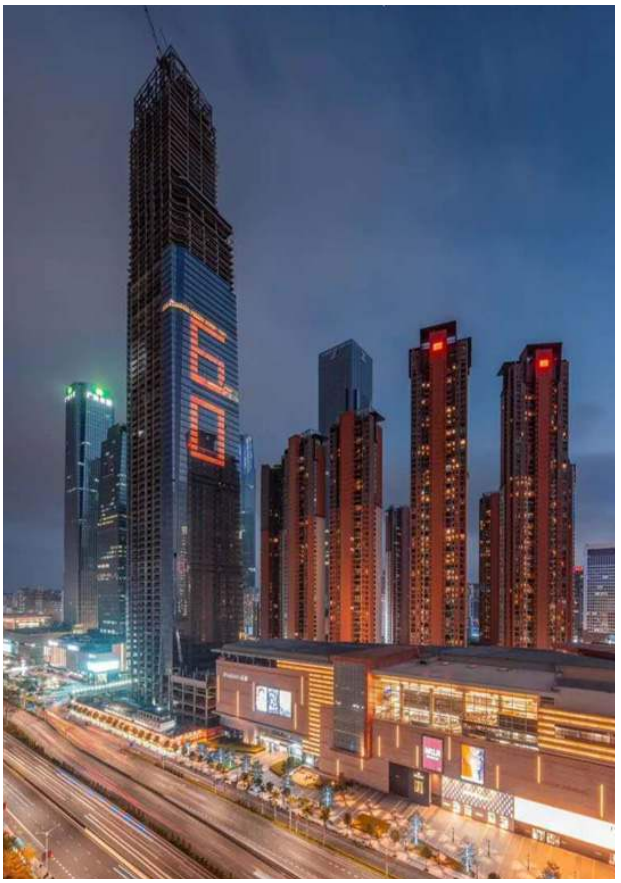
CASE STUDY OF NANNING CHINA RESOURCES TOWER

Stephen Y.F. Lai
Managing Director
Hong Kong

NCRC East Office Tower is a 411-metre, 87-story super high-rise building in Nanning, China, the capital of the Guangxi Province. The gross floor area of NCRC East Office Tower is about 220,000 m^2 above ground.

NCRC East Office Tower is a mix-used tower consisting of approximately 5,000 m^2 of boutique retail, 170,000 m^2 of Grade A office and 45,000 m^2 of luxury hotel. It will be connected to the shopping centre and buildings adjacent to the development through indoor and outdoor pedestrian corridors at the ground level and sixth floors respectively. In addition, it will be linked to public transportation through underground connections at the basement level. NCRC East Office Tower is under construction and will be the tallest building in that region upon completion in 2019.

Similar to the increasing trend of green buildings in China, NCRC East Office Tower has been designed to achieve a 2-star rating according to the Assessment Standard for Green Building in China (GB/T50378-2014 version) and the LEED® CS Gold standard in which a number of notable sustainable features are adopted.



1. MATERIAL SAVING AND MATERIAL RESOURCE UTILIZATION

1.1 Light Pollution

The effective ways to control buildings' light pollution include reducing the visual light reflectance of the building surfaces and being reasonable in the selection of lighting fittings, etc. Based on the Assessment Standard for Green Building in China (GB/T50378-2014 version), the visual light reflectance of curtain walls should not be greater than 0.2, and for NCRC East Office Tower, and Low-E coated glass (Low-E glass) is selected for the curtain walls in order to fulfill this requirement.

Low-E glass is a kind of glass plated with several layers of metals (including silver layers or metallic compounds).

It has a high visible transmission and high infrared reflectance which minimizes the amount of ultraviolet and infrared light that passes through the glass without compromising the amount of visible light.

1.2 High Yield Steel Bar Reinforcement

The Assessment Standard for Green Building in China (GB/T50378-2014 version) states that high yield steel bar reinforcement, with the strength of 400 MPa or above, can be regarded as one of the sustainable construction materials. On average, 12% saving in the total tonnage of steel bar reinforcement can be achieved by substituting 400 MPa high yield steel bar reinforcement for 335 MPa for which the latter is commonly used in the construction industry in China.

According to the design criteria from the Structural Engineer during the schematic stage, 400 MPa high yield steel bar reinforcement should be adopted for all structural elements for NCRC East Office Tower. From our measurements, about 65% of the total steel bar reinforcement for NCRC East Office Tower (both basement and tower portions) is 400 MPa. Based on a hypothetical calculation, more than 2,000 tons of steel bar reinforcement can be saved. However, on balance, we reckon that there should not be an additional cost for earning the credit point for this item.

1.3 Reusable Construction Materials

Used construction materials, which can be reused for permanent works straight away or after simple synthesis/ rejuvenation process or after recycling, can be counted as reusable construction materials. According to the findings from the Local Design Institute, the use of recyclable and reusable materials such as steel, wood, aluminum alloy, gypsum products, doors and windows, glass curtain walls, copper, etc. can be accommodated reasonably and practically for NCRC East Office Tower. So, there should not be additional cost for getting the credit point for this item as well.

2. ENERGY SAVING AND ENERGY UTILIZATION

2.1 Air-Conditioning System

To optimize the energy systems of buildings, there are different requirements for achieving the coefficient of performance (COP) at industrial and state levels in China. The LEED® rating system also provides a strong incentive to improve the efficiency of the air-conditioning system. In addition, based on the Assessment Standard for Green Building in China (GB/ T50378-2014 version), additional marks can be obtained if the COP of air-conditioning systems can meet the required standards such as the Energy Efficiency Design Standard for Public Buildings (GB/ 50189). In general, the higher is the COP ratio, the lower are the operational costs.

For NCRC East Office Tower, the COP of the centrifuge sets is upgraded from 5.1 to 6.1 and the chillers with screw compressors from 4.3 to 5.9 in order to fulfill the Assessment Standard for Green Building in China and obtain the required marks. From our estimation, a total of additional cost of RMB 3,000,000.00 approximately would be incurred. Such additional cost includes all relevant expenses for upgrading the fan coils, water pumps and air exhausters, etc., and also represents approximately 30% of the total cost for the sustainable features of NCRC East Office Tower.

2.2 Lighting System

For NCRC East Office Tower, all lighting systems at corridors, staircases, foyers, lobbies, open space and underground parking zones, etc. are equipped with the above mentioned energy-saving control measures to fulfill the requirements of the Assessment Standard for Green Building in China and to maximize the penetration of daylighting at the same time. In addition, the lighting systems at corridors, staircases, fan rooms and water pump rooms

are upgraded to reach the target value of 3.5 W/m^2 for lighting power density, which is specified in the Standard for Lighting Design of Buildings (GB/50034). Also, to reach the target value of lighting power density mentioned, high-performance T5 fluorescent tubes and electronic ballets are also adopted in the office zone.

Moreover, to implement the energy-saving control measures during night time, NCRC East Office Tower adopts the design of automatic or manual non-emergency indoor lighting system, in which the original lighting density can be reduced 50% from 11 pm at night to 5 am in the morning. Meanwhile, the lighting power density for outdoor lighting in the night-time is also designed according to the requirements of ANSI / ASHARE / IESNA90.1-2010, which are stipulated in the LEED® rating system.

From our estimation, a total of additional cost of RMB 2,000,000.00 approximately would be incurred for adopting the measures for energy saving and better energy utilization which represents approximately 20% of the total cost for the sustainable features of NCRC East Office Tower.

2.3 Water Saving and Water Resource Utilization

Water conservation is not only saving in end users' operational costs through reduced utility expenditures, but also enhancing the recycling rate of water resources, reducing the volume of water supply from the public utility and volume of discharge of sewage.

Cooling towers for the central air-conditioning system consume large amounts of water, at 30% or even 50% of the total water consumption of the whole building during operation. As such, a reduction of unnecessary water consumption in the cooling water system can bring profound improvement in water saving for the whole building.

According to the design brief at the schematic stage, non-traditional water resources have already been identified for use on the podium E&M floors of NCRC East Office Tower. For example, water collection tanks are put in there to collect the condensate water from the air-conditioning system and waste water from SPA and swimming pool. Such water collected, after filtration and sterilization, will be reused in cooling towers, water features at the landscaping areas and carpark cleaning. Furthermore, water saving laundry machines and sanity fittings at the hotel zone are also designed for water saving and better water resource utilization.

From our estimation, a total of additional cost of RMB 1,000,000.00 approximately would be incurred for adopting the measures for water saving and better water resource utilization which represents approximately 10% of the total cost for the sustainable features of NCRC East Office Tower.

3. CONCLUSION

There is a common perception that green buildings and the LEED® certified buildings usually come with a higher capital cost. That may not be true as the cost of every single project varies widely from case to case. Taking NCRC East Office Tower as an example, the additional cost for obtaining the 2-star rating according to the Assessment Standard for Green Building in China (GB/T50378-2014 version) and the LEED® CS Gold standard only accounts for approximately 0.25% of the total construction cost.

So, will sustainable designs cost more? Definitely yes, but they will bring benefits as well. We foresee that green features will become a must in the future designs, rather than "value-added" items for the super high-rise buildings as well as all the new project developments.

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As seen in:
International Journal of High-Rise Buildings, December 2017, Vol 6 No 4, 323-326, https://doi.org/10.21022/IJHRB.2017.6.4.323

Assessment Standard for Green Building in China. China Architecture & Building Press, Oct. 2014.

"China - Construction and Green Building." Export.gov, 25 July 2017, www.export.gov/article?id=China-Construction-and-Green-Building.

Gabel, Jason. "2016 Another Record-Breaker for Skyscraper Completions; 18 'Tallest Titles' Bestowe." CTBUH Year in Review: Tall Trends of 2016, Council on Tall Buildings and Urban Habitat, 2016, www.skyscrapercenter.com/research/CTBUH_ResearchReport_2016YearInReview.pdf.

"The Federal Commitment to Green Building: Experiences and Expectations." U.S. Office of the Federal Environmental Executive, 17 Sept. 2003, archive.epa.gov/greenbuilding/web/pdf/fedcomm_greenbuild.pdf.

Webb, Christina. "Green Building: Public Opinion, Semantics and Heuristic Processing." Electronic Theses and Dissertations, University of Central Florida, 2005, stars.library.ucf.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1513&context=etd.

PAST, PRESENT, FUTURE:

TECH IN RETAIL

Julian King
National Head of Retail
United Kingdom

There is no doubt that technology is changing the world we live, work, and play in. From BIM (Building Information Modelling) to our own apps that record and analyse data for clients, RLB Field and RLB Focus, tech is changing every sector, every market and every country RLB operates in. However, one sector that has seen more of a revolution than an evolution in the way it operates because of tech is the world of retail.

We all know that online retail is growing at a rapid rate with global online retail sales representing nearly 12% of total retail spending in 2018 compared to 8.6% in 2016,[1] with the UK having the higher e-commerce sales as a percentage of total retail sales (15.6%).[2] We have also seen retailers such as Laura Ashley in the UK change their retail strategy by closing some UK stores to concentrate on their global presence and their online presence. However, it is interesting to see how economists view these statistics believing that far from online disrupting the rules of retail as we know it, the traditional strategy of supply and demand remains robust. The factors for success, however, have evolved, with the cost of search, communication and trading goods digitally rather than physically decreasing. As the cost of the critical factors go down, as we source more efficiently, promote to our audiences more effectively and manage our supply chain and distribution effectively, the cost ultimately falls and the pro rata value of the product increases.

THE COST OF PREDICTION

Smart code and AI (artificial intelligence) as well as pure technology have their part to play in the fundamentals of the sale. We all know about Amazon's recommendation engine that guides us to other complementary products, effectively AI technology that aims to increase the overall value of the basket by using smart and low-cost prediction, using vast amounts of customer spend data harvested and interpreted, driving additional value from the sale and analysis of the data surrounding it. AI is becoming ubiquitous in our daily lives, with Alexa, Cortana and Siri learning from us every hour of every day. Whilst Netflix, Spotify and YouTube are busy suggesting viewing options and shaping our future reliance on predictive technology. As technology, AI code and analysis gets more advanced and the accuracy of prediction goes up, Amazon and the like are already looking not just to increase the value of that basket by suggesting other purchases at the point of online purchase, but shipping to willing participants what they might like to buy and allowing them to return what they don't want. So, effectively taking away the pesky choice making process! We know that our US counterparts are already experiencing this with the Amazon "wardrobe" concept which effectively is a trial of this idea. W

TECH AND THE FUTURE OF THE PHYSICAL RETAIL SPACE

So, if the laws of algorithms are stacking in favour of less human input into purchasing, what does this mean for the future of the retail environment? That is the million-dollar question. We all know that technology allows us to gather data from a physical thing and produce insights from that data. The Internet of Things (IOT) will allow this to happen machine-to-machine, again, meaning little, if any, user input. However, how will this affect our retail space? And how can we use it to help plan our retail space? For this we need to start with the outcome we want and determine the data we need. Most retailers will have technology operating their lighting and heating. They are also likely to have counters to read dwell and flow information. How about integrating this information so that the lighting and heat comes on when there are people in the store, rather than set to a prescribed time? How about using mobile proximity data to drive shelf edge graphics display technology?

TECH AND DRIVING CUSTOMERS TO STORES

If technology can be used more efficiently in the store, how can it drive people to the store? And what technologies can we see that can bring more people back into the high street and to towns? We are already seeing the success of mobile technology with Bluetooth beacons and GPS applications that highlight to customers their nearest store or outlet driven by brands and promoting products and services. However, what about offering digital promotions that work in real time. Super intelligent shelf edge labelling that reduces produce near the end of the shelf life? Or socialisation of data that lets you know if your friend is in the same shop or shopping street and offers you a 10% discount at the local café?

DEMOCRATISATION OF TECHNOLOGY

With all of this we need to think through our customer and our target audience. We also need to balance the advent of technology with an ageing population and those who might not have the income to digitise their future. Retailers need to think about how to lay the foundations of technology to make their stores smarter but without losing the market segment who can't afford to keep up with the tech. Like with all innovation, over time technology will become cheaper and as it does it will reach the wider market. However, retailers need to build their estates as agile as possible to allow for the integration of mobile and online to blend with the physical environment. In doing this we will allow technology to drive the best outcomes for us and helping to create retail space that benefits from technology rather than allowing technology to cannibalise our sales and drive customers away from our stores.

[1] "E-Commerce Share of Total Global Retail Sales from 2015 to 2021." Statista 2019, Statista 2019, Mar. 2018, www.statista.com/statistics/534123/e-commerce-share-of-retail-sales-worldwide/.

[2] Saleh, Khalid. "Global Online Retail Spending – Statistics and Trends." Invesp, Invesp, 2019, www.invespcro.com/blog/global-online-retail-spending-statistics-and-trends/.

Julian King
National Head of Retail
United Kingdom

Confidence today inspires tomorrow

Changi Airport Group will be expanding the capacity of Terminal 2 to handle up to 5 million more passengers a year from the current 23 million.

RLB Singapore has been appointed to provide the total cost estimating, procurement and contract administration services.

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DESIGN GOOOALS FOR FOOTBALL STADIUMS

LESSONS FROM THE UK AND THE US

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While from a fan's point of view, professional sports may be as close to a universal language as anything, there are compelling cultural differences in the business end of the industry. For instance, comparing American sports management, with its fast-forward focus on maximizing profitability and providing over-the-top customer experiences, may seem overly aggressive to the British, whose moderated approach is more rooted in tradition.

But given the international expansion of the countries' two top sports, soccer (or football as it's known in the UK) and American football, each culture can enlighten the other when pursuing innovations in sports facilities.

A SPORTING EXCHANGE

Both professional soccer and football have vigorously pursued targeted global growth. Since 2007, the National Football League has staged 21 regular season games in London, with four more scheduled for fall of 2019. The League also

has a ten-year agreement to play two games per year in the new Tottenham stadium, which is scheduled to open later this year and will be the world's first stadium with a retractable pitch that when opened, reveals an American football field underneath - perhaps a telltale sign of things to come. The NFL's former executive vice president for international operations has hinted that there will be a team based in England by 2021.

In the States, the growth of Major League Soccer (MLS) has been steady since its founding in 1996, with recent milestones - such as the fee for an expansion team reaching $150 million (in 2012, it was $40 million); in 2018, the Atlanta United team drawing more than 50,000 fans per game, and the average worth of a team is $240 million, up 7.6% from 2017 - reflecting its continuing development. And with America hosting the 2026 World Cup, the popularity and influence of soccer and MLS is expected to rise to an entirely new level in North America.

OWNERSHIP OPTIONS

In the US, it is the norm for professional athletic teams to be tenants of stadium owners, who can range from individuals to metropolitan sports districts to corporations. Although collegiate teams have an obvious home field, pro sports clubs' tenant status allows them the freedom to move from one city to another; they need not be "loyal" to a particular arena. Stadiums that are owned by the municipality or commercial operators are focused on programming that will maximize their commercial return and do not prioritize or favor any one particular end user.

In the UK, most soccer stadiums are owned by the club. In this instance, the investment into the stadium design is controlled directly by the sports team, and although they often accommodate other uses, the club very much concentrates on the core sport and its own revenue generation.

These financial structures shape a variety of facility design elements, from curating the fan experience to seating configurations. Here are some cross-cultural ideas and issues from the UK and the US on creating soccer and football venues that are both responsive to current needs and anticipate the trends of the future.

NEW-BUILD OR REMODEL?

In the UK, many stadiums have a deep historic significance to the fan base, particularly in relation to their geographic location. Demolishing or abandoning them to build new facilities elsewhere can severely test fan allegiance. Factor in the limited availability of suitable land parcels and the cost of real estate for such large projects adds to the argument for remodeling aging facilities.

As well, the overall development timeline for renovation is generally shorter than for new-build projects (particularly in the early phases of land acquisition and permitting), which means less down-time for the club's revenue stream. There is a greater use of public transport in the UK, so stadiums have fewer parking spaces relative to the stadium seating capacity.

Things are different in the States. Given the independent ownership model for arenas in the US, there is more flexibility - both financial and in terms of market - to develop new stadiums. To accommodate the demand for parking, these can be situated on the outskirts of a city, beyond the reach of transit systems. American stadia tend to be more destination venues where the fan experience is designed to extend over a longer period of time than just the duration of the game. To this end, they are increasingly incorporating hotels, dining, entertainment, and retail elements in their plans.

MULTI-FUNCTIONAL VENUE VERSUS SINGLE-SPORT

American football stadiums are not ideally suited to soccer by design: the playing fields are too short and narrow, and the stands are usually oval, not rectangular, in configuration. With capacity ranging from 60,000 to over 80,000, they are also grossly oversized for the 15,000-20,000 fans that typically attend MLS games (exceptions are in Seattle, Los Angeles, and Atlanta, each of which attract more than 40,000 spectators to games). To ensure a steady revenue, teams from other league sports commonly share the facility, so its seats are filled year-round. Concerts and large-scale cultural events are also booked into the schedule, further continuing the cash flow.

In the UK, most stadiums are focused on a single sport. This is partly due to the ownership model, as described above, and a very busy match schedule. Some stadiums do host more than one sport, with mixed results. The Ricoh Arena in Coventry shares soccer and rugby reasonably successfully from a facility point of view, albeit the relationship with the soccer team is strained. The London Stadium houses both soccer and other sports, but the transformation of the field and facilities incurs are costly in both time and budget. The effect of this versatility isn't wholly positive; even when the stadium is in soccer mode, the sporting atmosphere suffers, to the displeasure of fans.

ENGAGING THE CROWD THROUGH DESIGN

Unlike the fast-paced play of soccer, the stop-and-go action of American football allows ample opportunities for spectators to wander away from their seats, grab a snack, and return to the stands without missing any plays. Capitalizing on this, social gathering spaces such as restaurants, clubs, standing-room-only party decks, and other concourse destinations have become central to US venues as additional revenue streams tapping into both patrons and vendors or sponsors. This is also true in the UK, where the trend is now to offer more tiered hospitality packages. However, it must be noted that at soccer games in the UK, spectators are not allowed to consume alcohol in view of the pitch for the duration of the fixture, a fact that influences the planning of amenities.

The quest for generating an energetic atmosphere within soccer stadiums in the UK has had a significant impact on architectural design. Building a canopy on the stadium not only shelters spectators from the elements, but also reflects the roar of the crowd back onto the pitch, increasing fan excitement and involvement. The US adapts that concept (especially in locations that are subject to extreme or inclement weather) with roofed facilities, to attract events other than athletic contests to the venue.

TAKE A SEAT - OR NOT

In the UK, soccer venues are being designed to accommodate a more diverse fan base and family enclosures to develop a larger and sustainable fan base. At the same time, stadiums are focusing on creating atmosphere, especially to accommodate the ultra-fans, by bringing the fans closer to the field of play and having steeper rakes to the seating tiers. Developed for home fans, the "kop end" (the name invokes a hill in South Africa that was the site of a battle in the Boer War in 1900) is a single-tier standing area dedicated to intimidating away teams and fans.

In the UK, The Green Guide, a publication produced by the Sports Grounds Safety Authority, focuses on spectator safety at sports facilities. The Guide provides detailed recommendations to ground management, technical specialists such as architects and engineers, and all relevant authorities to assist them assess how many spectators can be safely accommodated within a sports ground. The re-introduction of safe standing areas - portions of the stadium that are fitted with rail seats or fold-away seats that function as both crowd control devices as well as seating - is also under consultation.

In the US, general admission tickets secure a G-rated, family-oriented experience - the youngsters, after all, are the future players and often the most educated and passionate of the present-day fans. Some new MLS venues are trying to replicate the kop end, to add a new element of authenticity to game day. Premium-section seats and private suites offer a more intense experience and conveniences, such as private concession stands.

CONNECTIVITY AND THE CUSTOMER

Throughout the US, WiFi is seen as an essential stadium service. In the UK, though, it's hotly debated, as clubs deal with the conflicting demands of fans expecting connectivity but potentially damaging attendees' engagement with the field of play, and therefore reducing the all-important ambiance. A possible compromise is the Jumbotron, again ubiquitous in the US but uncommon in the UK. The super-sized digital screens help keep spectators' attention on what's happening in the stands and on the turf - and away from their devices. Looking ahead, real-time virtual reality viewing may provide yet another electronic avenue for fans to keep up with the game.

MORE THAN A GAME

Competitive sports are a tremendous unifier of people on a global platform - the Olympic Games and the World Cup are the most prominent examples - and on a local level, as well. In the UK and US, football fans gather to celebrate not only their teams, but a common humanity. In addition to bolstering the bottom line for owners, informed, responsive sports-facility design contributes to a rewarding social experience in the stadium and beyond.

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IS AFRICA RISING?

AN ANALYTICAL REVIEW OF GROWTH IN THE AFRICAN CONSTRUCTION INDUSTRY

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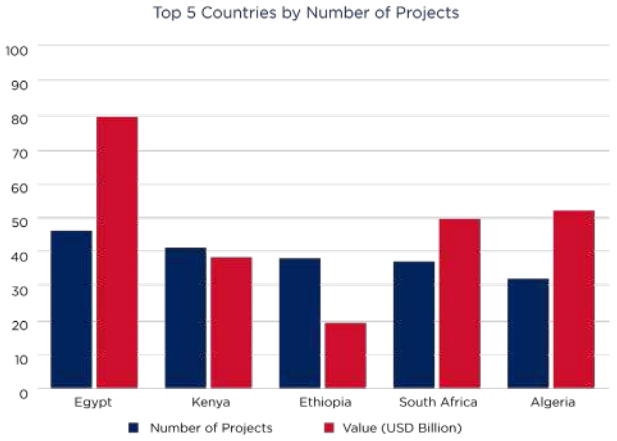
In light of the political and economic unrest across the African continent, we are often led to the question: Is Africa Rising? It seems as though there is a great deal of development within Sub-Saharan Africa, but are these new developments in actual fact stimulating and contributing to economic activity in this region? We have combined research and analytics to derive an objective conclusion.

AFRICAN CONSTRUCTION

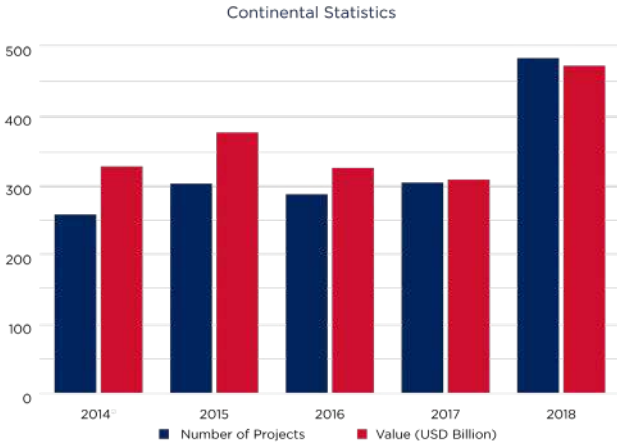
As the Chinese proverb states: *If you want to prosper, first build roads*. Over the past year, this proverb proved to be true for the African construction industry. The transport infrastructure sector – typically roads, bridges and railways – made up almost 40% of the 482 tracked projects.

In Deloitte's 2018 Africa Construction Trends Report[1], which includes 482 projects valued at US$50m or above that have broken ground by June 2018, the top 5 countries by number of projects and comparative value, are as follows:



The above graph is an analysis of the growth in the number of projects for the period 2014 to 2018, as conducted by Deloitte.

Kenya and Ethiopia are two countries progressively passing South Africa by and this allows the assumption that further growth is to be expected, despite a lower investment influx.



The number of projects qualifying for this survey increased by 59.1% year-on-year. As a region, East Africa has the largest number of recorded projects, sitting at 139. North Africa accounts for the largest share of projects in terms of value at US$148.3bn (31.5%). An extract from the research indicates an overall increase of 69 projects across Africa.

The top performing sectors in terms of an increase in the number of projects in 2018 as of 2017 are: transport infrastructure (road and bridge construction) at 38.8%, real estate at 22.8%, and mining at 22%. This clearly shows an attempt by governments to enhance trade and growth-supporting infrastructure across the continent.

"Sub-Saharan Africa will have the fastest growing construction industry over the next 5 years, growing by a compound annual growth rate of 6.6% per year, from 2018 to 2022", according to GlobalData.[2] There will be a steady increase in construction activity in Nigeria, supported by government efforts to revitalise the economy, by focusing on developing the country's infrastructure. The concern is whether these new projects will actually be completed due to the country's current economic standing.

The outlook for Tanzania is positive, with construction growth expected to reach over 9% in 2019. The exponential growth is attributed to the construction of commercial and residential buildings. Kenya's growth, on the other hand, is driven by ongoing public infrastructure projects and the continued development of more buildings within various sectors.[3]

South Africa's construction industry will improve quite slowly, as construction spending has suffered - negative investor sentiment and slow economic growth have manifested due to the declared technical recession in 2018. However, the construction industry increased by 2.3% quarter-on-quarter. Taking this into account, it leads us to believe that there is indeed growth in the construction sector, although not necessarily solely due to new projects, but rather the inclusion of older projects being completed. Various countries are looking at revitalising their cities and increasing their spend, especially within the transport infrastructure sectors.[1]

[1] "Africa Construction Trends Report 2018." Deloitte, Deloitte Touche Tohmatsu Limited, 2018, www2.deloitte.com/za/en/pages/energy-and-resources/articles/africa-construction-trends-report.html.

[2] Leke , Acha, et al. "Africa's Overlooked Business Revolution ." McKinsey Quarterly, GlobalData, Nov. 2018, https://www.mckinsey.com/featured-insights/middle-east-and-africa/africas-overlooked-business-revolution.

[3] "The Francophone Africa Dossier." African Property Skyline Magazine, Sept. 2018.

[4] "Unpacking the Tanzanian Perspective." African Property Skyline Magazine, Sept. 2018.

RETAIL

Skyline Magazine[4] indicates that there are 10 times more shopping malls in Africa as compared to 2000, with continued growth looming for the medium term. Although there are more shopping malls, establishment of these facilities may prove to be challenging over the long term. In Sub-Saharan Africa, Abidjan (West Africa) serves as a point of entry into Francophone (French-speaking African countries) Africa for retailers. It offers the broadest range of modern retail in Sub-Saharan Africa, apart from South Africa. Brands such as Shoprite and Massmart have changed their strategy in order to uphold their good standing within the African market. The growth still exists, however, the typical challenges within the Sub-Saharan Africa region will make it tough to sustain.

The rise in retail construction provides optimism: not only are populations expanding and urbanising rapidly, consumer surveys show that incomes are also on the rise and shopping habits are becoming more sophisticated.

REAL ESTATE

Senegal and Cote d'Ivoire are the most attractive real estate markets in terms of size, depth, structure, financial performance and funding facilities for developers. Both offer significant opportunities in residential, industrial and retail markets, proving that if the right markets are tapped into, construction on the continent is certainly ready for further growth and development.

The industrial and logistics markets of West Africa is based on 2 primary axes, Abidjan and Dakar. These axes are the highest performing within the region, controlling the flow from the main ports to hinterland countries. The shortage of adequate warehouses along these commercial roads is a significant opportunity for industrial real estate. Creating, yet again, an opportunity for development.

Tanzanian land and cement costs are at their lowest in a decade, making Tanzania the country that creates the perfect opportunity to build within all construction sector players. The GDP growth is at 7%, but real estate investments across all assets are growing substantially faster compared to other sectors. Dar es Salaam is experiencing significant infrastructure investment, both public and private, creating new opportunities for developers.

Despite the rise in the self-build market, the housing market in Zambia offers large-scale opportunities. This is possibly the largest single

opportunity for speeding up economic growth. There is a significant untapped opportunity in student accommodation in Lusaka. With the growth of Lusaka's tertiary education sector there is also a gap in the market for accompanying student accommodation.

CITY DEVELOPMENT

The scope of hotel developments is mostly restricted to cities, prominent in the increase of refreshment of many major cities throughout Africa as well as the development of various new ones. The primary concentration is currently in Abidjan and Senegal, both of which appear in the top 10 cities in Sub-Saharan Africa.[5]

Mauritius can be seen as a country that is forging the path for Africa in the mixed-use sector. It is becoming the hub between Africa and Asia for corporates, financial institutions, education, medicine and ICT, to mention a few. According to RMB's "Where to Invest in Africa",[6] Mauritius scored a 7.5 out of 10 in terms of it being a very strong operating environment. This environment is further compared to its economic growth score, making Mauritius a rising country within this sector.

WHAT NEXT?

Africa has the world's youngest population – growing at nearly 3% p.a. – and McKinsey[2] estimates that "By 2034 the working-age population of Africa will be bigger than that of China or India."

The key to building well-targeted infrastructure that can connect African economies to global value chains, is governments' dedication to the task. The Brookings Institution[5] notes that in order to sustain economic growth rates of 3% - 3.5% in Africa, spending on infrastructure as a proportion of the GDP (Gross Domestic Product) needs to be between 5% and 6% annually. African countries achieving this percentage includes, Mauritania, Cote d'Ivoire, Togo, Gabon and Angola.

[5] "Lusaka Real Estate Market Report 2018." African Property Skyline Magazine, Sept. 2018.

[6] "Where to Invest in Africa 2019." RMB - Global Markets, FirstRand Bank Limited, 2019, www.rmb.co.za/landing/where-to-invest-in-africa.

To conclude, it does seem that Africa, although one step at a time, is indeed rising. The primary sector earmarked for growth on the continent is logistical infrastructure and city development or rejuvenation. Solving this shortfall is essential for agribusiness, retail construction and industrial development and will prove to be fruitful over the long term.

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TREETOP LIFE IN THE CONCRETE JUNGLE

TIMBER STRUCTURES AS GAME CHANGERS

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Significant revisions to the National Construction Code in 2016 have heralded a burgeoning market for mid-rise timber construction in Australia. Timber's expanding market share is little wonder: preliminary modelling indicates construction costs could be reduced due to shorter construction times. In addition, across several key criteria (from sustainability, health and productivity through to durability, thermal performance and fire resistance) timber not only adheres to - but exceeds - Australian Standards and client specifications. Conferring myriad advantages on property developers, contractors and tenants, timber structures are set to become a game changer for Australia's mid-rise urban development sector.

From 1 May 2016, significant revisions to Australia's National Construction Code ushered in a simpler, more affordable review process for proposed timber buildings up to 25 metres (eight storeys) high.

Prior to this, restrictions were imposed on timber buildings over three storeys, mainly due to concerns about the material's fire resistance. The National Construction Code required lengthy, expensive assessments of proposed timber structures, necessitating reliance on materials like concrete and steel for mid-rise urban developments (such as apartments and office buildings).

With the revisions to Australia's National Construction Code now firmly in place, timber construction is already delivering a wide range of benefits for developers, the domestic building industry and tenants alike.

COST, SPEED AND CONSTRUCTABILITY

According to research undertaken by Forest and Wood Products Australia (FWPA), timber construction can be cheaper than traditional in-situ construction techniques[1].

FWPA's research indicates that the structure cost savings - which account for just a quarter of total building costs - were in the order of only 2% for an eight-storey residential building.[2] However, the use of timber allows for faster construction, which is where the potential for cost savings come into play.

Timber materials are fabricated to order (enabling further pre-fabrication), they are light (at 20% the weight of reinforced concrete), simple to assemble and install, and can be lifted with pre-installed edge protection. Timber floor panels require no curing or propping, which means that the installation of follow-on services (such as heating, air-conditioning and electrical services) can commence the day after the floor above is installed. When combined, these factors have resulted in construction programs that are almost a third shorter compared to traditional in-situ techniques.

Several other characteristics unique to timber deliver further savings. For instance, the light weight of timber means that massive timber panels rarely exceed 2 tonnes. This drastically reduces crane, scaffolding, and foundation costs.

These program savings are evident in Forte, Australia's first mid-rise timber project. Constructed by Lendlease in Melbourne's Docklands in 2012, this nine-storey project was installed on-site by a team of just six people (including the crane crew) in just 10 weeks - 30% faster than a reinforced concrete construction program.

Savings are also well-illustrated by five-storey The Green apartment building in Parkville, Melbourne. The Green is a 5,100m^2, 57 apartment complex developed by Frasers Property Australia (formerly Australand) and Citta Property Group in 2014. According to Frasers Property Australia, average build costs per apartment were 25% less than that of a conventional reinforced concrete apartment construction.[3]

Similarly, Rider Levett Bucknall undertook a case study of Caulfield Village Precinct 1 (Building 2A) in 2018. This case study demonstrated that a switch to timber construction would result in an overall saving of 2.2%.

Completed in August 2016, the Caulfield Village Precinct 1 (Building 2A) is a five-storey building with 65 apartments. Its initial specifications included a concrete flat plate slab with concrete columns and precast concrete core walls and stairs, and a façade featuring glazing, brick veneer and lightweight cladding.

Rider Levett Bucknall undertook costings based on the following revised specifications: in-situ concrete podium; suspended slabs and roof comprised of a lightweight cassette system; Cross Laminated Timber (CLT) lift, stairs and stair shaft walls; and load bearing intertenancy and corridor walls comprised of timber stud.

The revised specifications reduced the construction program by five weeks. An additional two weeks were eradicated as the curing process was eliminated, allowing finishing trades to follow on more quickly. In addition, the columns in the basement and the size of the pad footings were reduced, and columns throughout the upper levels were eradicated.

COST PLANNING

Costing timber is not unlike costing any other building material. It is not the use timber itself that impacts cost. Rather, it is the benefits gained in areas such as construction speed and site considerations that can slash the overall project cost.

There are several site issues that need to be considered when costing timber. These include: use of a mobile crane versus a tower crane; site access; delivery route and location; laydown area; number of levels versus the size of the floor plate; and complexity of design.

Similarly, a range of construction issues need to be evaluated, such as: cranage share factor; the amount of exposed timber; the size of the apartments versus the span of timber; vibration or over-rail works; and temporary weather proofing. Most importantly, the flow-on cost reductions resulting from reduced site labour should be considered, including: site accommodation, temporary services, bin and waste removal, loading and truck movements.

There are also environmental factors that can impact cost planning (such as installation season, weather protection, and wind speed), as well as contractual and financial factors (such as the type of timber used, deposits, and cash flow, particularly as timber construction fails to follow the standard s-curve).

PRODUCT PERFORMANCE

Strength and Durability

Strong and durable, timber will last for hundreds of years when properly maintained. It is resistant to corrosion, frost, heat and pollution. Backed by Australian Standards for design and construction, it can withstand some of Australia's most extreme weather conditions.

Thermal Performance

Timber is a natural insulator. The air pockets within timber's cellular structure create a natural barrier to heat and cold. According to Planet Ark, as an insulator, timber is 15 times better than concrete and masonry and 400 times better than steel.[4]

Fire Performance

Timber is combustible. However, the way timber burns is slow and predictable, making its fire performance highly measurable and often preferable to other materials. When timber is exposed to fire, a layer of charcoal forms on its surface. This charcoal acts as an insulator, protecting the inner core of the timber, and slowing heat penetration and the rate of combustion. As a result, timber can carry its load for a prolonged period compared to materials such as steel.

Sustainability

The use of timber in construction can help reduce carbon emissions, and remove CO^2 from the atmosphere. Naturally grown, timber removes CO^2 from the atmosphere, and then stores this carbon - approximately 50% of the dry weight of timber is carbon[5]. In addition, timber manufacturing uses considerably less embodied energy than concrete, steel or aluminium. Building with one cubic meter of wood (rather than concrete or bricks) can save up 0.75 to 1 tonne of CO^2 emissions.[6]

Wellness and Productivity

As a natural material, timber is thought to provide a connection to nature that improves physical and mental wellbeing. Planet Ark's House, Health, Humanity report demonstrated that being surrounded by timber lowers heart rate, blood pressure and stress levels. The use of timber in office design has shown to increase productivity by 8%, and well-being by 13%.[7]

Conclusion

Clearly, timber construction is delivering a raft of benefits for developers, the domestic building industry, and tenants alike. Australia's construction industry should consider the use of timber for its efficiency and program savings, for its strength, durability and thermal performance, for its sustainability - particularly in a market where the infrastructure boom is pushing the cost of structural trades upwards, and resources are becoming more and more difficult to procure.

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[1] Sinclair, Rin. "Timber Set to Rise to Eight Storeys (and Cut Costs) Under National Construction Code Changes in May." Forest and Wood Products Australia, Forest and Wood Products Australia Ltd, 28 Jan. 2016, www.fwpa.com.au/images/mediareleases/2016/mr_NCCCodeChange_Specifiers__PC_Final.pdf.
[2] "The Benefits of Wood." Make It Wood, Planet Ark, Oct. 2011, makeitwood.org/benefits/.
[3] "Housing, Health, Humanity ." Make It Wood, Planet Ark, Mar. 2015, makeitwood.org/documents/doc-1253-wood--housing--health--humanity-report-2015-03-00-final.pdf.
[4] Forsythe, Perry. "Rethinking Apartment Building Construction – Consider Timber." Technical Design Guide, Forest and Wood Products Australia, Apr. 2018, www.woodsolutions.com.au/system/files/WS%20TDG%2027%20Rethinking%20Apartment%20Building%204-18.pdf.
[5] Forsythe, Perry. "Rethinking Office Construction – Consider Timber." Technical Design Guide, Forest and Wood Products Australia, Dec. 2017, www.woodsolutions.com.au/system/files/WS%20DG26%20Rethink%20Office%20Construction%204-18.pdf.
[6] Reid , Hannah, et al. Using Wood Products to Mitigate Climate Change: A Review of Evidence and Key Issues for Sustainable Development. International Institute for Environment and Development, Jan. 2004, www.fao.org/fileadmin/user_upload/rome2007/docs/Using_wood_products_to_mitigate_climate_change.pdf.
[7] Knox , Andrew, and Howard Parry-Husbands. Workplaces: Wellness + Wood = Productivity. Forest and Wood Products Australia, Feb. 2018, www.woodsolutions.com.au/system/files/Workplaces%20Wellness%20and%20Wood%20-%20Productivity.pdf

DEFINING & DELIVERING FIRST CLASS AIRPORT CONSTRUCTION PROJECTS

THE ROLE OF COST MANAGEMENT

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Executive Vice President
North America

I travel a lot for business, and one thing I've learned (besides confining my luggage to a single carry-on bag) is that I've never actually been in an airport that's finished. From landside to terminal to airside, construction seems to be a perpetual reality at large, medium, and even small facilities.

This activity isn't all just cosmetic in nature. As the Federal Aviation Administration points out in its National Plan of Integrated Airport Systems (NPIAS), airport infrastructure needs are propelled by several factors: current and forecasted traffic, use and age of facilities, and changing aircraft technology that requires airports to update or replace equipment and infrastructure. The majority of investment at commercial airports remains in passenger-facing applications, such as new or upgraded terminals, consolidated rental car facilities (CONRAC), and ground access projects.

Airports are powerful engines for economic growth and opportunity. They account for $1.2 trillion in economic activity - or seven percent of the total U.S. workforce and eight percent of GDP. And the industry outlook is positive: the FAA reported that 2017 marked the eighth consecutive year of profitability for the domestic airline industry. Looking forward, there is confidence that U.S. airlines have finally transformed from a capital-intensive, highly cyclical industry to one that generates solid returns on capital and sustained profits. The 2018 FAA forecast calls for U.S. carrier passenger growth to average 1.9 percent per year over the next 20 years.

With so much economic clout - to say nothing of their primary function of moving people and goods around the world - it's obvious that keeping facilities in top condition should be a priority.

Perhaps because we've reached a critical stage of maintenance - the average age of an American airport is 40 years - there's a substantial amount of airport construction work (both replacement and repair) that currently has a green light. Through 2021, airports in the United States have infrastructure projects underway to the tune of nearly $100 billion; in the New York metro area alone, La Guardia, Kennedy, and Newark airports are part of a $20 billion redevelopment plan.

UPDATING THE PASSENGER EXPERIENCE

There was a time when people used to dress to travel, flying was glamourous, and airport design reflected that with dynamic and cutting-edge structures. Over time, air travel evolved into mass transit and airports were designed for one principal purpose: a transportation gateway with a more bare-bones design reflecting a more transient focus. Now though, the airport is evolving once again and they are designed as destinations in their own right, offering travelers (who spend a national average of two hours in the terminal) a full complement of amenities. Food and beverage concessions run the gamut from fine dining to fast food chains to take-aboard snacks. Retail choices have outgrown newsstands and duty-free shops to include luxury goods, specialty boutiques, and pop-up stores. Ticketing procedures and security screening and baggage handling technologies have greatly evolved (and continue to do so). Terminal architecture has also become more sophisticated, with towering atriums, soaring pedestrian bridges, and other eye-catching features adding to the environment.

EVALUATING CHOICES

As essential as these design elements are, they increase the project's complexity and in turn contribute to the cost of capital improvements. With new airport terminals often running more than $750/square foot, every effort must be made to control costs. Employing a life-cycle approach to the initial procurement may ensure a more fiscally responsible use of funds because it includes operation and maintenance costs, which are sometimes overlooked when making decisions about systems and materials. A simple example: Though the upfront costs - in both dollars and time - of pouring a 200,000-square-foot terrazzo floor far exceeds the expense of installing the same quantity of carpeting in a terminal, an analysis of the two surfaces dictates that the wise choice would be the terrazzo. Subjected to the heavy foot traffic of an airport, carpet wears out and requires periodic replacement - a shortcoming that doesn't apply to the more durable terrazzo.

UNDERSTANDING CONSTRUCTION CHALLENGES

With airport work, phasing and coordination are often the biggest drivers of cost. Sometimes renovations can cost more and take longer than new construction because of phasing and coordination. Cost planners must find the sweet spot between budget, schedule, and scope of construction to maximize the efficiency of the project. When well planned and executed, the risk of diminished productivity is reduced - a major goal for all stakeholders.

With limited land available for expansion, most airports are faced with squeezing more performance out of their existing buildings. And because they are active 24 hours a day, there's no window of downtime during which construction can take place; this is a major reason why costs typically run about 40%-50% more for airport construction than they do for a "conventional" project.

It's definitely not business as usual. Construction work of any scale has to have a minimal impact on airport operations, and therefore is most often conducted at night. Logistical concerns can slow down the process, from construction workers having to park offsite, then take a shuttle bus to the job (a process that can double the time spent in transit - and correspondingly reduce the time spent at work) to staging material deliveries at a time and place that minimizes the disruption to airport activity. Behind-the-scenes issues include conducting background checks for workers to receive security clearances to gain access to restricted areas of the facility; in a tight market for skilled labor, this can be more of a problem than expected.

Surrounding the active construction zone, vehicular and pedestrian detours must be planned with an eye to safety, security, and convenience, as well as compliance with TSA and FAA protocols. It's essential that wayfinding signage posted in the affected areas of the terminal be visible and clear, as it may be directing passenger circulation through the building for years to come, in cases of major building overhauls.

ENSURING A SMOOTH LANDING

While every airport construction project is unique, they share a common goal: to deliver a superior passenger experience through modern, responsive facility design. With costs climbing to ever-increasing altitudes, achieving that target requires a knowledge-based costing strategy that is simultaneously detail-oriented and focused on the big picture, and applied with skill and vision.

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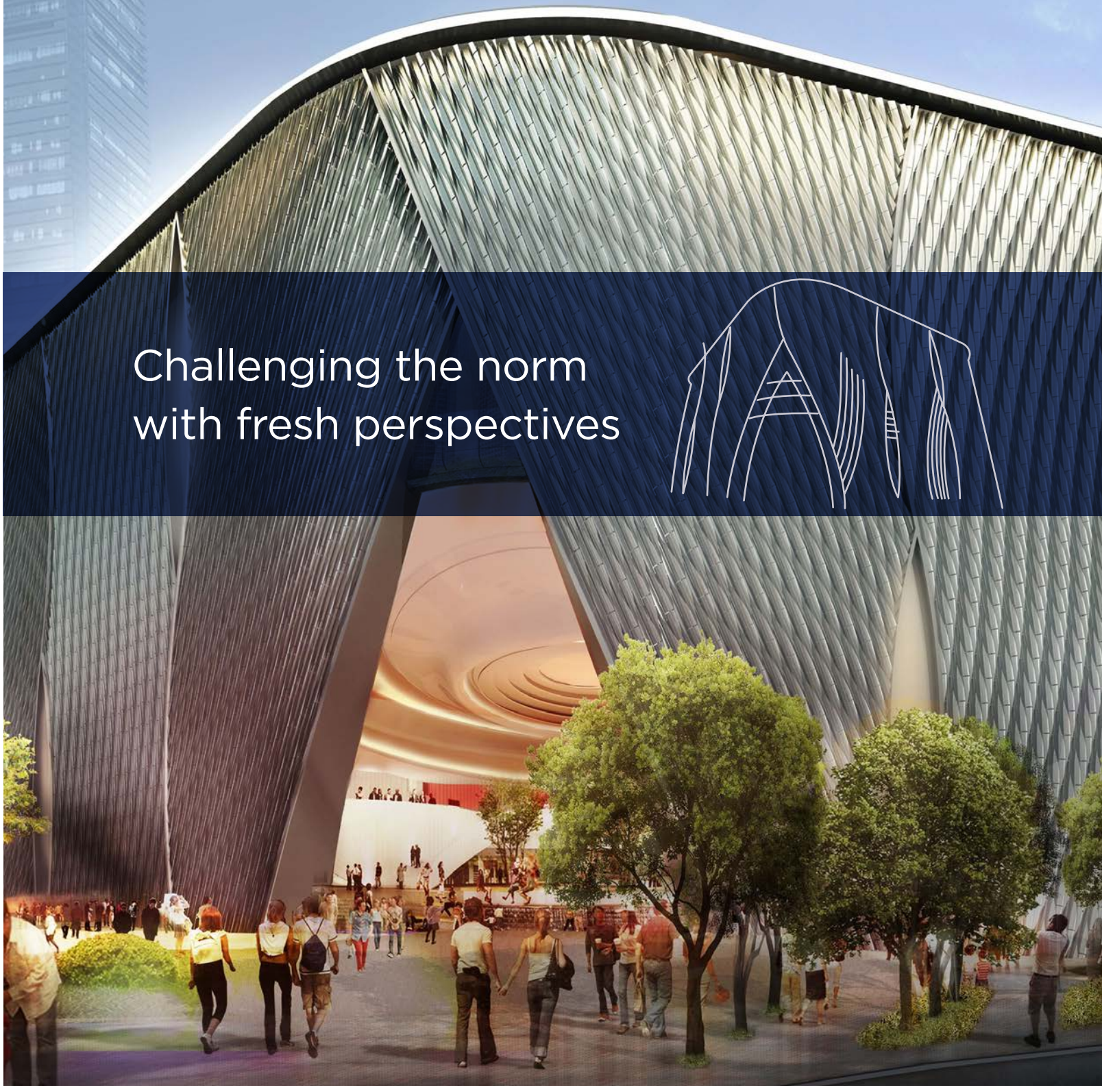
Challenging the norm with fresh perspectives



The “Xiqu Centre” (a Chinese Opera House), a winning design of an international design competition, was inspired by traditional Chinese lanterns. The eight-storey building has an area of 28,164 m^2, housing a Grand Theatre, a Tea House Theatre, studios, seminar hall and F&B facilities, which were designed to world’s best-in-class acoustic performance and theatre design standard.

RLB was involved extensively in value engineering to ensure cost effectiveness and in finding an optimal design solution that was adopted within the cost, time and quality standards. By working closely together with the Authority and the project team, both international and local consultants, RLB was instrumental in the successful delivery of this Project.

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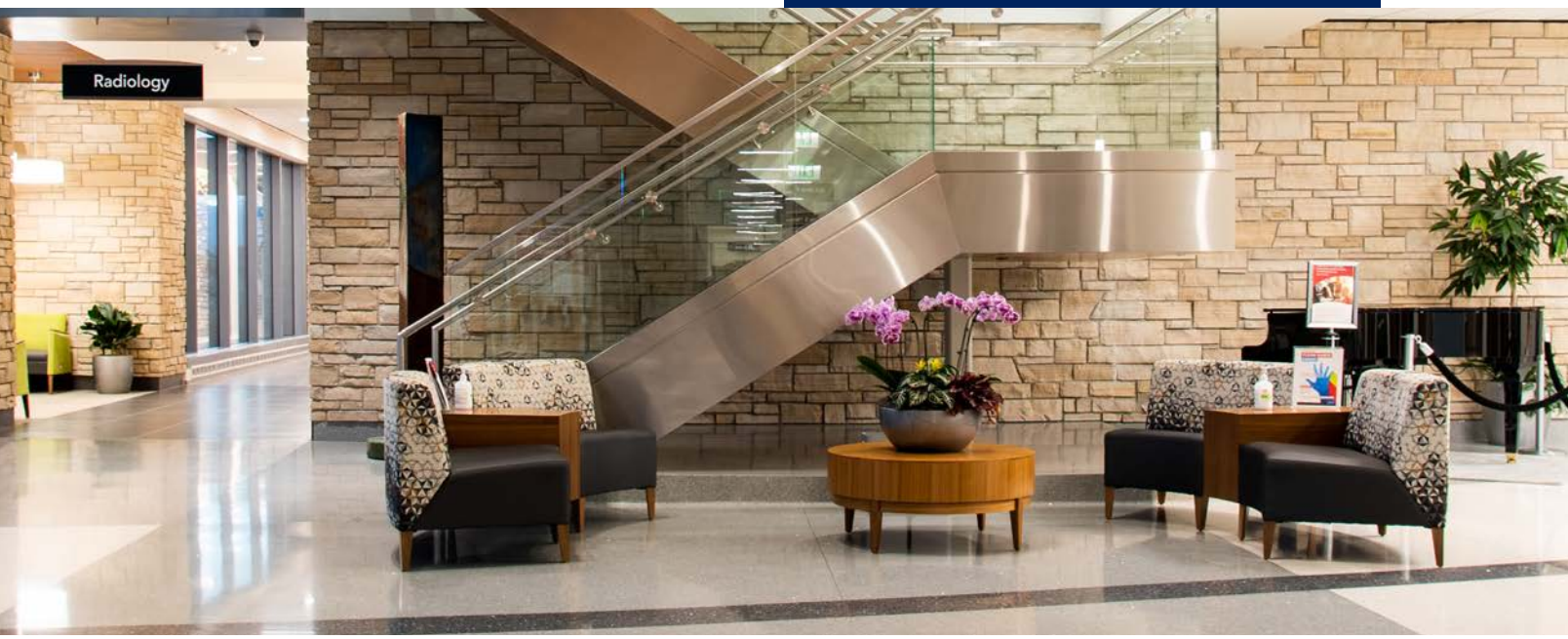
INCREASING THE PACE

OF HEALTHCARE DESIGN EFFICIENCY

Conor Ellis
National Head of Healthcare
United Kingdom



Over the past decade the design industry has witnessed several important developments to aid client understanding and reduce the risk of adverse or unwanted design mistakes that impact both on the client and the professional advisor. These improvements include BIM, 3D+, repeatable rooms, Virtual Technology, standard component products, open architecture systems usage, offsite manufacture, and many other techniques. All of which impact positively on aiding and informing clients and planners as to how a building could visually look, remove inefficiency, reduce costs and reduce and remove design flaws.

One of the main challenges in the health and science built environment is achieving a signed off brief for clients and architects. The design process is inevitably iterative as, in many parts of the global health design community, it requires liaison with commissioners, clinicians, local planners, other local health organisations and finance teams. Planning high quality, efficient and flexible health facilities requires a careful blend of quantitative analysis (activity and capacity modelling) and qualitative analysis (feedback from clinical and design workshops). Traditionally the quantitative and qualitative information is separated with an activity model and a schedule of accommodation with no in-built links between the two. Additional complexity is brought about through approval documentation and project plans that frequently start in one financial

year but are not completed in the same rendering activity, finance and cost data needing to be updated. This means constant changes (recent experience has shown up to 15 versions of spatial areas) with commissioners of services and national ministries often wanting capital and revenue costs to be the latest available to the current indices.

The need to constantly update two separate components can result in a cumbersome, inefficient process for incorporating changes, increasing the risk of duplication and omission. As health schemes are subject to technical development or indeed change, value engineering and scope alterations mean that many iterations of a final schedule can occur.

There have been attempts made before to speed up interaction between raw and modelled data and interactive systems. Too often these have tended to focus on data or finance but provide only generic high-level typical department adjustments.

For those schemes completing in 2020/21 RLB is working to build a completely new model that will enable standard areas (compliant with good working practices) to be populated, and where data changes (e.g. updates in population, disease incident, length of procedure /stay, or changes in location) an automatic regeneration of the interactive model can occur.

CHALLENGING THE NORM

We always start with looking at the clinical or scientific environment. It is crucial that designs are driven by the clinical or scientific working model and when working with clients we ask questions such as 'What changes will occur?', 'How will we make it more efficient?', 'What technologies will be adopted?', 'What will change?', 'What settings and what improvements can be made?', as seen below:

Transforming Care

Brief Development 1. **How do you work now?** 2. **How will you work in the future?** 3. **What can we do to add value?** 4. **Design solutions**

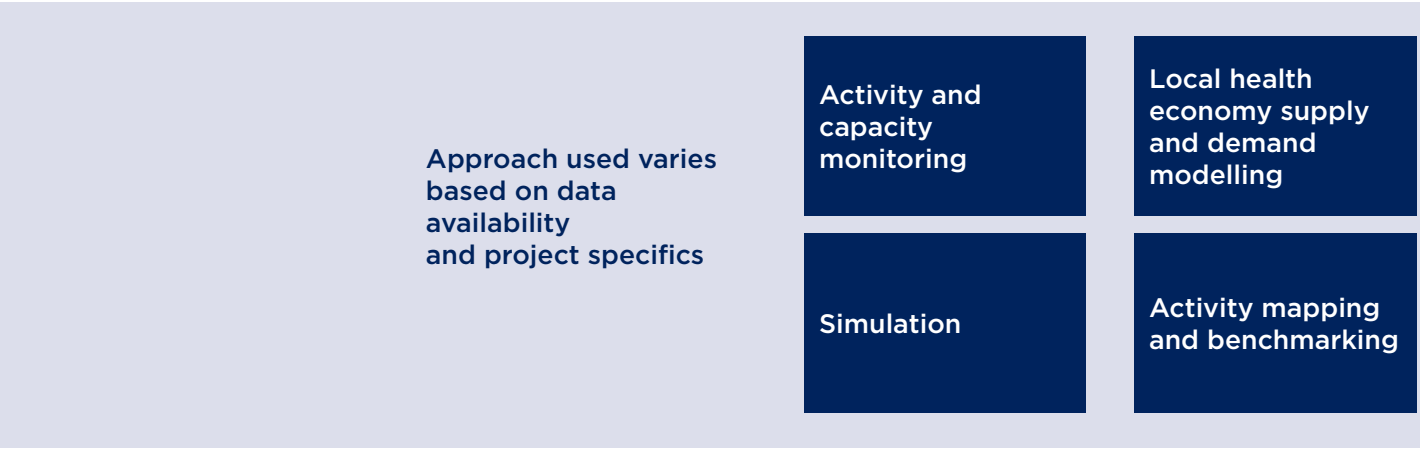
- Full Clinical Output Specification
- Patient Pathways
- Flow, separation and interaction
- Key adjacencies
- Relationships with the wider health community

- The facility of the future
- How can we be clear about interaction?
- The immediate patient journey, possible relationship to other clinical departments
- IT and service transformation

- Form follows function
- Lean solutions
- Improved clinical outcomes
- Enhanced patient experience
- Improved efficiency
- Value for money

This then allows the team to redefine the future data activity outputs. In a recent project we delivered changes that included the impact of:

- 2% annual shift in medicine admissions reduction
- 2.4% annual reduction in emergency admissions
- Growth in day cases and move from day case to Out Patient Department (OPD) procedures
- 20% efficiency gain in general medicine and elderly care by community intervention teams and admissions avoidance
- Reducing outpatient follow ups by 50% overall and
- 50% of remaining follow up cases being undertaken in community settings



This results in briefing more standardised buildings which are flexible and can cope with change. Blending types of activity rather than specialty specific inputs will be the way forward. Treatment pods will replace many of the conventional Emergency and Ambulatory zones.

LEADING HEALTH PLANNING EXCELLENCE

We are trialling this on two hospital projects – one of which involves an Emergency Department and is a mix of new build and refurbishment works, and one of which is pure new build. We are creating an integrated model that should carry forward to collect all data and enable a quicker, more accurate and clearer audit approach to healthcare design.

It is harder to do this in refurbishment, since each project is different. However, we are working on a way to make the process simpler and more efficient with this new methodology which will result in 2-3 days of input rather than 5-6 days and less risk resulting in less margin for error.

ECONOMIC AND STRUCTURAL BENEFITS

Advantages of an integrated model:

- The advantage of right first-time inputs
- Reducing time by at least two weeks
- Make quick versions available as each iteration is created resulting in a saving of an additional two days on subsequent stages of the process
- The real saving is in the aborted work it avoids which can often be £10-15k per iteration and reduces credibility of design team members
- Where 5-10 iterations occur this means a total saving could exceed £100k
- Removes delay in changing construction and town planning

Building such a model should allow less iterations and an end result that has the buy in from all the influencers and relevant parties. Surely this will lead to a more effective brief for the architects and a more efficient build for clients.

Conor Ellis
National Head of Healthcare
United Kingdom

A better tomorrow through flawless execution today

Built over an expanse of more than seven acres with eight separate buildings, Park Lane consists of 217 ultra-luxury condominium units, ranging from 800 to 6,000 square feet of indoor/outdoor living. The one-of-a-kind project is located steps away from world-class beaches and the cosmopolitan city center of Honolulu, Park Lane Ala Moana offers its residents luxurious, private estate homes with resort-like living.

RLB provided project management and cost consultancy services for construction of the new landmark project, which was delivered on time and within budget.

RLB.com

RLB Rider Levett Bucknall

FORECASTING CONSTRUCTION EXPENDITURE IN HONG KONG

H K Yu
Director
Hong Kong

The year 2018 saw the completion of two major infrastructure projects in Hong Kong. The Guangzhou-Shenzhen-Hong Kong Express Rail Link commenced operation in September 2018 while the Hong Kong-Zhuhai-Macao Bridge was open to the public in December 2018. Both are mega-sized projects, costing HK$89.2 billion (US$11.5 billion) and HK$70.8 billion (US$9.1 billion) respectively for the Hong Kong sections alone. These two projects are only two examples of the many infrastructure and building projects commenced and completed in the past few years, which is easily one of the busiest periods experienced by Hong Kong's construction industry in recent decades.

This is illustrated by the annual total construction expenditure in the 15 year period between 2003 and 2018 as shown in Figure 1. In the financial year 2009-2010, the total construction expenditure was about HK$150 billion (US$19.3 billion) (adjusted to September 2018 price level). Since then, there had been significant increases every year until it reached the historical high of HK$266.5 billion (US$34.3billion) (adjusted to September 2018 price level) in the financial year 2017-2018, an overall increase of more than 70% over an eight-year period.

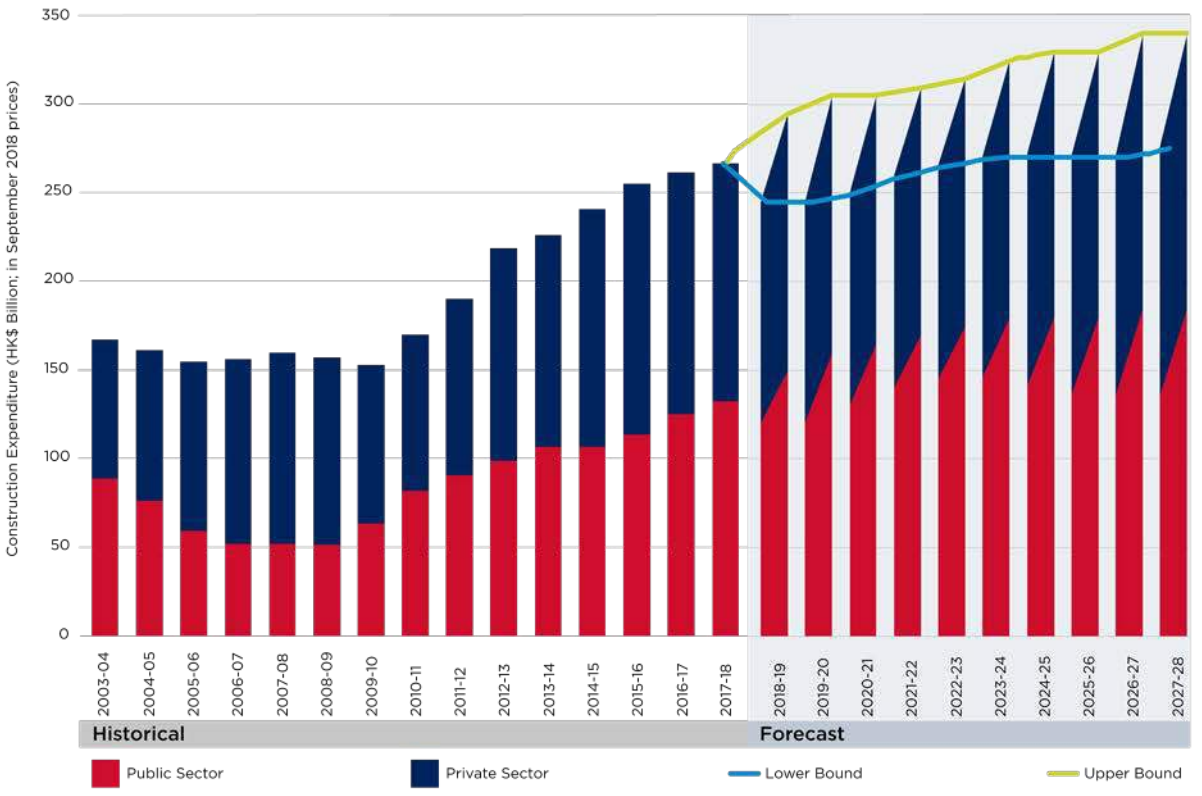
The reasons behind the rapid growth in construction activity in the past few years can be traced back to the Hong Kong government's 2007-2008 Policy Address introducing the Ten Major Infrastructure Projects which include, apart from the two projects mentioned above, the development of the old airport site at Kai Tak, West Kowloon Cultural District and a major Mass Transit Railway line. Some of these projects are still in progress. At the same time, Hong Kong's economy recovered from the Asian Financial Crisis in 1997 and the economic downturn caused by the SARS outbreak in 2003. The rising property market induced more developers to invest in new residential developments. The rise in property prices resulted in a worsening housing affordability issue to which the government responded by building more public housing.

THE NEED FOR A FORECAST

The steep increase in construction activity in just a few years' time had significant impact on the construction industry, including a serious shortage of skilled labour that is also ageing, a rapid rise of construction cost, falling productivity, deterioration in the quality of construction, and project delays. Many players in the industry had been requesting for a projection of construction activity in future years so that contractors, architects, engineers, worker unions, education organisations and the like were able to plan for and respond to the future workload.

This is important, as the construction industry is one of the major contributors to Hong Kong's economy. According to the Census and Statistics Department (C&SD)'s publication in 2018 entitled "2016 Gross Domestic Product by major economic activity ", the industry makes up 5.2% of Gross Domestic Product (GDP), before counting the contribution to a number of inter-related sectors

FIGURE 1: CONSTRUCTION EXPENDITURE IN HONG KONG



Source: Construction Industry Council, Rider Levett Bucknall

such as real estate (5.1%), professional and business services (5.9%) and transport & storage (5.9%). Also a significant provider of employment, the industry employed approximately 340,000 persons from managers to workers in 2017, an increase of 25.9% from 270,000 in 2011. This included an estimated 120,000 manual workers employed at construction sites in 2017.

In response to the industry's needs, Hong Kong's Construction Industry Council (CIC), whose main functions are to forge consensus on long-term strategic issues and convey the industry's needs and aspirations to the government, formed a Focus Group on Projected Construction Expenditure in 2011 with the goal of forecasting construction expenditure in Hong Kong for the coming 10 years. Rider Levett Bucknall Hong Kong, being a key member of the Focus Group, has played a significant role in analysing historical data and formulating the methodology for the forecast. Since the publication of the first set of forecast data in 2013, Rider Levett Bucknall Hong Kong has helped CIC to update the forecast on a bi-annual basis.

MEETING THE CHALLENGE

Such kind of forecast has never been carried out in Hong Kong and therefore is particularly challenging given the small but open economy. Construction activity in a given period of time is affected by many factors such as change in economic climates, fluctuations in the property market, government policies and initiatives, interference of work programmes due to political, social and economic reasons, as well as factors on a micro level including project delays due to ground conditions, site constraints, inclement weather and statutory approvals.

The construction expenditure forecast covers both the public and private sectors including building works, civil engineering works, repair, maintenance, alteration and addition works, and electrical and mechanical works. Forecasts for the public sector are generally based on estimates of future capital expenditure in response to government initiatives mentioned in Policy Addresses and Budget Speeches. Forecasts for the private sector are derived from a range of analyses including land sales, building approvals, town planning approvals and market researches by property consultants.

Recognising the inherent uncertainties of forecasts of this nature, the construction expenditure forecast is presented in an envelope with an upper bound figure and a lower bound figure.

LOOKING AHEAD

The latest set of forecast data as shown in Figure 1 projects an annual construction expenditure in the order of between HK$245 billion (US$31.5 billion) and HK$340 billion (US$43.7 billion) (at September 2018 price level) in the next ten years. The level of construction activity is expected to remain at a high level similar to that of the past three years. There will be significant investments in capital projects in the public sector, including the Three-Runway System at the Hong Kong International Airport, the current and the second ten year Hospital Development Plans, student hostel development, public and subsidized housing programme, Railway Development Strategy 2014 and New Development Areas in the New Territories. In the private sector, developers are still keen to start new developments as the projected strong demand for residential apartments will remain, despite the recent moderate decline in property prices.

The projected level of activity not only is expected to generate massive commercial opportunities, it also places increasing pressure and risk on the industry. There are concerns that the industry may not be able to cope with the consistent high level of construction activity in the next ten years while delivering good quality projects on time and within budget. It is a general consensus that the problems encountered in the past few years when the construction expenditure rose rapidly will have to be addressed.

Partly as a response to the forecast of a sustained high level of construction expenditure in the coming decade, the Development Bureau of the Hong Kong government recently published a document entitled "Construction 2.0" trying to address the industry's challenging future by focusing on three pillars, namely Innovation, Professionalisation and Revitalisation. Consultation is underway. No doubt, without the forecast it would have been difficult if not impossible for players in the construction industry to plan for the future.

H K Yu
Director
Hong Kong

Shaping the future of the built environment

A significant and striking addition to the Brisbane skyline, 1 William Street provides a new integrated workplace for the Queensland public service in Australia. A major catalyst project for the Queens Wharf precinct, the project offered the opportunity to develop a landmark commercial office tower and reintegrate an undervalued section of the foreshore back into the physical and social fabric of Brisbane City.

RLB provided cost management and quantity surveying to the iconic 46-level tower, which provides a symbol of Queensland's strong sense of purpose, identity and confidence in its future.

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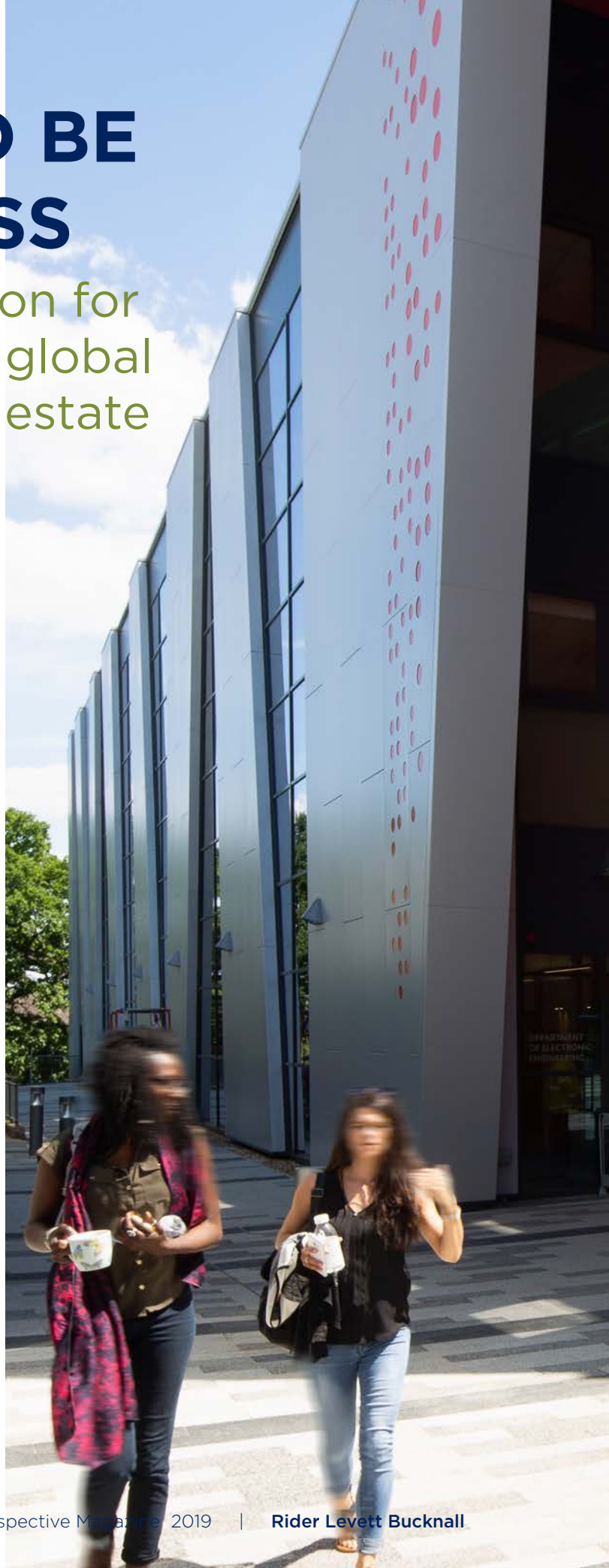
RLB Rider Levett Bucknall

THE RACE TO BE BEST IN CLASS

Increasing competition for students is driving a global contest in university estate development.

Stephen Scott
National Head of Education
United Kingdom



As the world is shrinking and becomes more digitally mobile, universities are no longer just competing with other institutions in their own city or country but across the globe. In the last year we have seen surveys from the UK Times Higher Education publication showing regions like Australia and Canada coming up the rankings, making inroads on the territory held traditionally by the UK and the US as the places to study. And within the emerging markets, countries such as Malaysia and Egypt are making their mark in the Higher Education field.

Competition for students and academic credibility on the global stage is fierce. Universities across the globe are out to attract international students and academics and indeed business partners in the race not only for additional income but to increase their international standing.

STATE OF THE ART FACILITIES

University campuses have an increasingly important role to play in this competitive environment and is seen as a key factor in attracting staff and students. Creating an award-winning landmark building, such as the Frank Gehry designed Dr. Chau Chak Wing building which RLB worked on at the Sydney University of Technology, can be well worth the investment if it generates the buzz to attract

students and academics and boosts the standing of the institution. As well as providing a focal point for the university, the building provides a range of high-quality internal spaces that deliver unique study and teaching environments.

The promise of new state of the art facilities can also help attract business into the mix. Collaborations with business are becoming increasingly sophisticated as Higher Education Institutions look to make their funding go further and develop closer relationships with industry. The National Automotive Innovation Centre, at University of Warwick, is particularly interesting, as it is a collaboration between WMG, at the University of Warwick Jaguar Land Rover and Tata Motors UK Centre. Opening later in 2019, the Centre, within the Prof. Lord Bhattacharyya Building, will be the largest of its kind in Europe. It will be a beacon for automotive research, bringing together up to 1000 of the brightest minds from industry and academia, to develop future vehicles and mobility solutions.

Creating state of the art facilities has many benefits. However, university buildings need to do more than this. Changing pedagogy and demand from students for more contact time and engagement with their lecturers has driven a need for space that fosters interaction and collaboration. The age of the 'chalk and talk' lecture theatre is perhaps coming to an end with the recognition that different people learn in different ways. This is reflected in the Learning Innovation Center (LINC) at Oregon State University, another RLB project. The LINC introduces new styles of learning space that support collaboration and student participation, including Parliament and "In-The-Round" classroom designs that bring students closer to their lecturers and create a more interactive environment. Ample break out space is also included to encourage collaborative learning and provide a range of study environments.

THE RISE OF DIGITAL LEARNING

As well as trying to respond to changing pedagogy, university space planners face other challenges. The last five years has seen virtual learning grow exponentially. Universities are no longer bound by their physical structures – they can offer learning opportunities to a global community in multiple campuses and countries, and to timescales chosen by the individual student. Technology also offers flexibility around when people choose to learn and significantly enhances the ability to fit

PICTURED: The Beatrice Shilling Building at Royal Holloway, University of London, UK

courses around a career. As an example, today's technology enables students to do lecture-style learning in their own time, only coming together for all-important face-to-face tutorials and discussion groups.

A purely online approach is clearly not suitable for all faculties. Some subjects are more suited to a higher level of virtual interaction than other fields of study, which require more hands-on experience and specialist facilities such as laboratories, workshops or studio space. At the same time, these technical facilities will require the investment to remain leading edge and high-spec to attract students.

In the UK, universities are looking to manage an estate to deliver courses to students, whichever degree route they take, from part-time students, to students commuting from home to those wanting the full 'traditional' university experience.

FLEXIBLE MASTER PLANNING IS KEY

All these factors mean University buildings above all need to be flexible, to respond to fluctuating student numbers, changes in the demand for specific courses and changes in the way those courses are delivered – virtually or physically.

Buildings such as the Beatrice Shilling Building at Royal Holloway University achieve this by incorporating the principals of easy reconfiguration and variable use of space from the outset of the design process, with large span structures, adaptable M&E systems and multi-use spaces incorporated into the building.

This degree of flexibility also needs to be reflected at a master plan level. Universities are striving to create 'sticky' campuses that encourage students to remain on campus through the range of facilities and spaces on offer. Research shows that the longer students spend on campus, the more beneficial the impact on academic results. Perhaps that's a no brainer but it does require Universities to respond to changing student demands for leisure facilities, shops and food outlets, as well as a range of study spaces. For instance, in the UK we have seen a move away from the traditional student union bar to coffee shops and food outlets where students can collaborate and socialise at the same time.

As university education has become more global, so it has become more competitive. There is no doubt we are seeing the globalisation of the contest in university estates with built assets being used to differentiate Universities and attract students (and their fees) on an international stage. Against this backdrop of increasing commercialisation of the estate, we are seeing rapid change in the way courses are delivered and the expectations of students.

All this means that a flexible estate is essential to respond to these challenges. At RLB we can draw on our experience of working across the globe, sharing best practice and drawing on what works.

Stephen Scott
National Head of Education
United Kingdom

Taking ambitious projects from an idea to reality

The Discovery Head Office, an award-winning commercial building located in the business hub of Johannesburg, is an environmentally-innovative creation by Boogertman + Partners Architects and also the largest single-phase commercial office development in Africa. The building comprises 111,000 m^2 of rentable area and, in particular, boasts a yoga deck, soccer arena, gymnasium and putt-putt course. It is a true manifestation of Discovery's brand purpose and ambition as a market leader in the insurance industry.

RLB's extensive involvement on this project included full scope quantity surveying services, from inception to project close-out. The completion of this complex structure was achieved within budget.

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THE RAIL INFRASTRUCTURE BOOM

Alistair Aitken, MAIQS, CQS
Director
Australia

If puns were appropriate, the rail sector in Australia and New Zealand is "full steam ahead", but what does this mean for those operating within this buoyant sector?

BACKGROUND

As populations of our cities rise, as roads become more congested and as employment and residential patterns change and public transport services improve, Australians and New Zealanders are making a choice to use passenger rail services.

With strong political support underpinning significant investment in the rail sector, there are other factors influencing the overall growth, including:

- Federal and state funding commitments
- Improved efficiency and passenger experience in the use of technology
- Link between improved rail services and housing affordability
- Reduced network congestion by the separation of freight and passenger rail

DEMAND

The rail industry is facing a skills shortage, driven by unprecedented demand caused by competing major projects, and never has one sector, in recent generations, faced such concurrent demand of this magnitude and scale.

There are more than 10 major rail projects either proposed or currently under construction valued in excess of $1 billion. The largest of these, Sydney Metro, is anticipated to be a $20 billion plus investment resulting in more than 66 kilometres of new rail line, with major metropolitan rail projects underway elsewhere including Adelaide, Auckland, Brisbane, Canberra, Melbourne and Perth. This is in addition to unmatched investment in regional networks, including the Inland Rail project ($10 billion), and Victoria's regional rail upgrade, to name but a few.

Significant investment is also being observed in the enhancement of existing infrastructure and rail networks.

New railcar programmes are well underway in order to replace existing ageing rolling stock fleets, coupled with the need to support the expanded networks and the pressure that such network expansion imposes on existing rail fleets.

Rail systems technology has also seen significant uptake with a number of Communications Based Train Control projects underway, which aim to make better operational use of existing rail networks by allowing more trains to run more often.

Separately, and given the rate of technological advancement, increasing demand to build digital radio systems are occurring to replace existing analogue systems, which provides the ability to transmit data whilst also providing increased reliability and flexibility together with providing more efficient rail networks and supporting plans for future network expansion.

WORKFORCE

In previous booms, the differing regional performance and diversity of Australia and New Zealand assisted in the steady flow of a transient and skilled workforce across boundaries and oceans, however, for some, this was a temporary move until such time as market conditions improved in their traditional "home".

As such, the rail boom is posing a significant challenge to many businesses in the recruitment and retention of staff throughout Australia and New Zealand, a challenge faced by clients, consultants and contractors alike.

SKILLS SHORTAGE

The Australasian Railways Association report that the industry in Australia and New Zealand is already experiencing skills shortages and warns more than 20 percent of the sectors existing workforce is expected to retire within the next decade, highlighting that there is a chronic shortage beyond construction activities in being able to operate and maintain existing infrastructure, let alone expanded freight and metropolitan rail networks.

The consequence of such skills shortage is that construction projects are likely to incur significant cost and/or delivery blowouts, which is already being witnessed on a number of projects in the delivery phase, including the much publicised Sydney Light Rail project.

As such, there will be significant pressure to clients and businesses in the increased cost of wages, together with the availability of specialist plant and equipment, and these are likely to have a greater impact on construction costs with rises anticipated

to impact the following key cost components:

- Labour, plant and material costs
- Contractor risk allocations (where applicable)
- Contractor overhead and profit recovery

Where in the past consultants and contractors have pursued every opportunity, there are signs that they are being selective in current market conditions, often as a result of an improving flow of secured work driven by the boom. Another factor that may limit the appetite to bid for work is the high cost of tendering, which on projects of this scale and complexity are often substantial, with no guarantee of success.

EMERGENCE

As a result of the continued and significant investment in rail infrastructure projects, coupled with the financial stability afforded by Australia and New Zealand (when compared with other international markets), there has been an emergence of international players, predominantly in the contracting field.

The emergence of new players in itself creates opportunity by providing further competition to what is otherwise often a narrow field, and with it, this brings a flourish of skilled construction professionals that may otherwise never have made it to our shores, however, there remains concerns as to the short-term approach adopted by some businesses as they pursue other international projects and the subsequent inability to capitalise on the up skilling and retention of knowledge and resources within Australia and New Zealand.

PROCUREMENT

In consideration of some of those factors highlighted, improved procurement of services and/or works is essential to mitigate some of the risks identified.

On the part of consultants and contractors, there has been an uptake in the number of partnering and joint venture arrangements. Whilst this creates a shared ownership of risk amongst two entities, it also provides opportunity to pursue larger projects that previously may have been beyond their reach as individuals, whilst also amalgamating resources in order to demonstrate greater resource capability.

For clients, recent trends have seen a shift change away from the traditional forms of procurement, with greater emphasis on Alliance Contracting, Early Contractor Involvement or partnering arrangements, together with initiatives such as contribution towards tender costs.

The allocation and ultimate ownership of risk on these projects will be one of the biggest challenges in the delivery of these projects which ultimately will require a level of maturity and pragmatism developed in a collaborative manner.

Undoubtedly, those involved in the planning and delivery of these rail projects will have exposure to projects of a scale never seen before, however, the challenge for all involved will be to ensure that there are sufficient programmes and incentives in place to support the development, training and retention of a skilled workforce. Failure to embrace this will be a lost opportunity for generations to come.

Alistair Aitken, MAIQS, CQS
Director
Australia

Building for the future

Midlands Logistics Park in Corby, East Midlands, UK is a total of 2,500,000m ft^2 of new industrial and logistics space; a mix of pre-let units ranging from 250,000 ft^2 to 950,000 ft^2 with approximate values between £12m and £35m.

Working with Corby Land & Development Limited (a JV between Mulberry Developments and Frogmore Real Estate Partners). The contractor was VolkerFitzpatrick Limited.

RLB was appointed to provide employer's agent and cost management services.

RLB Rider Levett Bucknall

RLB.com

PARSING THE FINE PRINT

FIVE ELEMENTS OF CONSTRUCTION CLAIM ANALYSIS

John T. Jozwick, Esq., CFCC
Executive Vice President
& General Counsel
North America

As technology enables building projects to achieve hitherto unknown degrees of design complexity, as construction schedules continue to accelerate, and as the pricing and delivery of materials grows increasingly volatile, one thing remains constant: construction claims.

There are numerous facets to the complete and clear understanding of a construction claim. How does one systematically determine the proper right, correct payment of money, accurate change in contract time, or other relief when analyzing a claim? The significance of the answers to these questions should not be underestimated, as they directly impact the settlement.

Underscoring the need for clarity are the alternatives to claim settlement: dispute arbitration or litigation. These paths to resolution are costly in terms of time and money, a reality that can be appreciated by all parties, both owner and contractor. In 2015, the median time frame from filing with the American Arbitration Association to award was 232 days; the median length of a jury or bench trial was slightly more than 2 ¼ years. As far as the bottom line goes, the hourly or per diem fees charged by lawyers and arbitrators are considerable (and vary widely); what is notable is that in litigation, there is no time limit on the discovery process, while in arbitration proceedings, discovery is often limited to document exchanges and a relatively small number of depositions, if any.

In my experience, zeroing in on five key elements - which are outlined below - can help put a claim into sharp focus, and expedite its analysis and ultimately, its resolution.

1. DETERMINE ENTITLEMENT UNDER THE CONTRACT

I am surprised at how frequently the narrative of a claim does not address the contract provision which defines it. The reason that this is important is that the provisions of a change-order clause, delay clause, suspension of work clause, unusually severe weather clause, no damages for delay clause, or changed site condition clause each have different requirements for notice, what the contractor may be entitled to for quantum, or what is allowed for delay.

2. VERIFY TIMELY NOTICE WAS GIVEN

A claim analysis must verify that timely and adequate notice was given of the claim incident. The time allotment for this can vary, depending on the nature of the claim. An example of how timely notice may differ can be seen comparing a Notice of Claims clause (AIA Document A201 – 2017, Section 15.1.3) which requires notice within 21 days versus a Changed Site Condition clause (Section 3.7.4), which calls for notice within 14 days. Not observing this detail in the contract-stipulated schedule puts at risk the right to file a claim and raises the possibility that the claim could be waived altogether. Relatedly, claimants are well advised to use any contractually-authorized means of delivery (a specific overnight carrier, for instance) and, if possible, obtain a proof of receipt, when submitting their claim notice.

3. CALCULATE QUANTUM PER THE CONTRACT WITH SUPPORTING DOCUMENTATION

As with the first two key elements of claim analysis, a close reading of the contract is also central to calculating quantum. The contract may allow or restrict costs when a claim is submitted. When using AIA Document A102 – 2017 Standard Form of Agreement Between Owner and Contractor where the basis of payment is the Cost of the Work Plus a Fee with a Guaranteed Maximum Price, Article 7 identifies the costs that can be included and Article 8 defines the costs that are not to be reimbursed. In a contract with a no damages for delay provision, no quantum is allowed for a delay event. Under a suspension of work clause claim, it is typical to only allow increased field costs, but no additional profit

on the increased costs. Many change order clauses restrict mark-up (overhead and profit) on self-performed work or subcontractor work. Therefore, correctly understanding the basis of entitlement under the terms of the contract is critical to how the request for additional compensation is calculated.

4. ANALYZE DELAYS THROUGH THE LENS OF PROJECT SCHEDULES AND CONTEMPORANEOUS RECORDS

The longest sequence of required construction activities to bring a project to completion is known as the critical path. Unless remedial steps (such as resequencing work) can be taken, delays to any one critical path activity can push the entire project past its deadline. Noncritical activities that can be absorbed by the schedule without affecting the on-time completion of the project are said to "float".

Any request for a time extension necessitates a schedule review to ensure it is achievable within the constraints of the project. Claims that focus on delays should be analyzed to determine the specific category of the event. Determining what activities constitute the critical path, how much float is associated with noncritical activities, and the nature of the delay - is it an excusable, non-excusable, compensable, non-compensable, concurrent, critical path impact, or consumption of float - must be taken into account when evaluating a claim.

An excusable delay is a delay for which the contractor is entitled to an extension to the contract time for completion. Plainly put, the contractor's late completion is excused. A compensable delay entitles contractors to not only a time extension, but also to compensation. The compensation takes the form of an adjustment to the contract price for any added costs that flowed directly from the delay. Unexcused delays are those for which the contractor has responsibility, and which entitle the contractor to neither a time extension nor any added compensation. If the contractor has not completed the work when required and the delay is unexcused, the owner will be entitled to its damages for the contractor's failure to complete the project on schedule.

Additionally, it is recommended that any critical-path schedule be tested with other contemporaneous project records - such as daily reports - to determine the veracity of the schedule and claimed delay.

As critical as they are, daily reports are often a weak link in the paper trail because they fall short in their level of detail. In addition to documenting weather conditions, describing the work performed, and tallying laborers and equipment on the job site, they should also track the time spent by personnel and equipment by work categories or cost codes. Reports should present a consistent quality of information of detail on both the typical work day and days when delays or interruptions occur. It should be stressed to all partners on the job that keeping current with daily reports is required, as back-dated documents may not be accepted as evidence by courts, should that come to pass.

5. ENSURE THERE ARE NO WAIVER/ESTOPPEL ISSUES

Finally, claims need to be scrutinized to determine if there were any waiver or estoppel issues that would bar the claim. The most common examples include conditional and unconditional lien waivers. An unconditional waiver surrenders the right to file a lien regardless if one is paid or not. A conditional waiver surrenders the right to file a lien upon payment. Beyond the contract, the language used in change orders may waive and release claims for additional costs or time, and should always be reviewed. This area of analysis - the Achilles heel of an otherwise valid claim - is frequently overlooked.

ONE MORE THING...

In this article, I promised to explore the five key elements in a conscientious claim analysis process. But I'm going to add a sixth point to the list: meticulous documentation. This is the bedrock of every dispute situation. And it goes beyond having a well-written contract. From archiving emails and keeping meeting notes to detailed project reports, maintaining a complete and thorough record of communication throughout all phases of a project is the foundation of making a credible claim. Conveying the importance of this to colleagues as well as clients solidifies your - and your firm's - reputation as a fair and skilled analyst, and helps builds trust among all parties.

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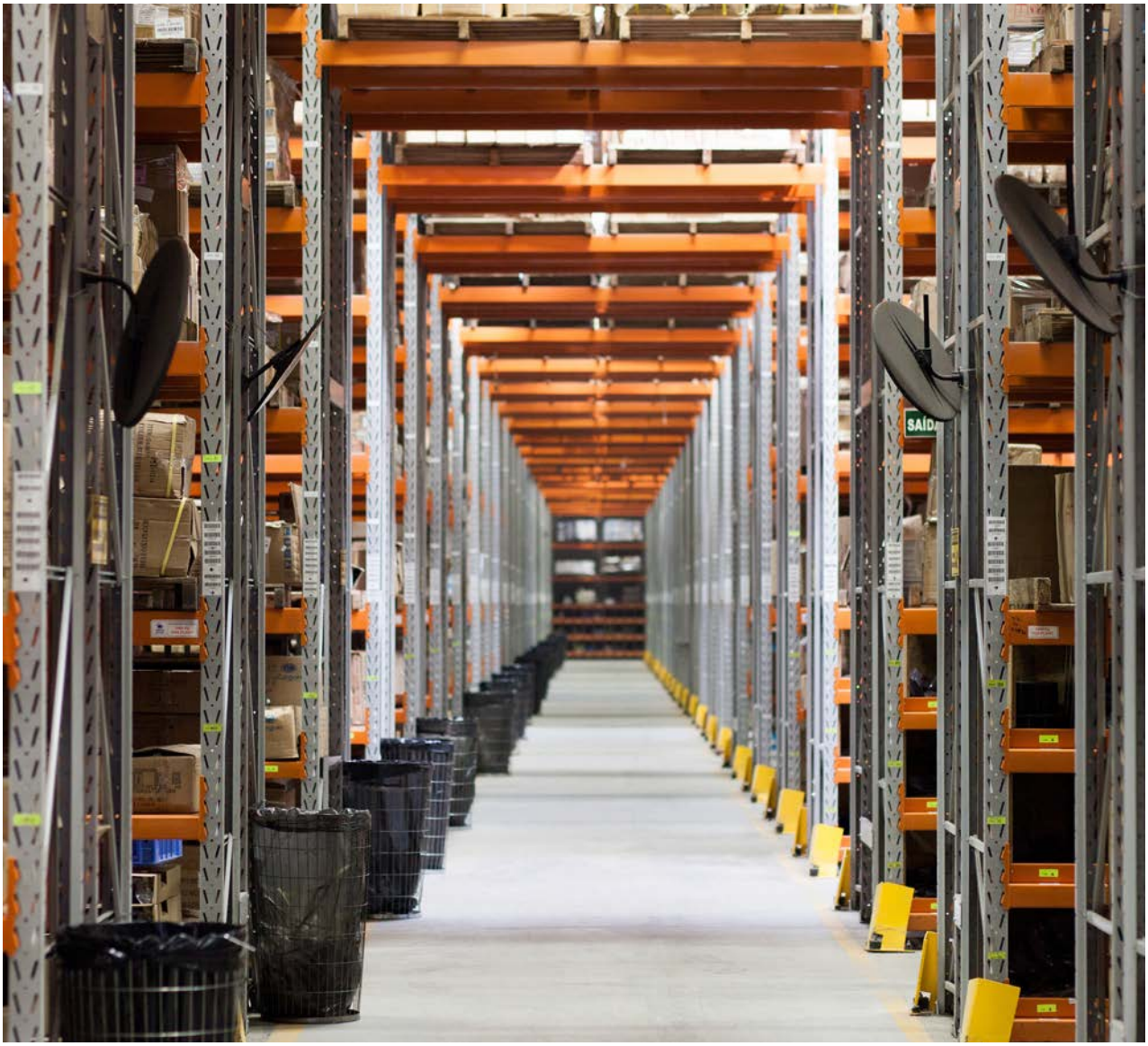
A NEW ERA DAWNS: THE INDUSTRIAL REVOLUTION



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There is no doubt that the confidence in the construction industry continues to be tempered by growing political uncertainty across the world. However, one area of growth that continues to boom is the industrial & logistics construction market that has recently seen a 22% increase in project.[1]

ONLINE RETAIL DRIVING THE MOVE TO 'CLOSER TO CUSTOMER' APPROACH

As the current boom of e-commerce continues to rise, online retailers are moving their focus from large fulfilment centres of 500k - 1million ft^2, or "mega sheds", to fulfilment facilities of between 200-500k ft^2. There is also a requirement in the logistics delivery process to get the products closer and faster, "next day", to the customer. This is prompting logistics companies and retailers to build smaller hubs, or "last mile delivery" spaces of 50-150k ft^2. The final link in the delivery chain or "last ¼ mile" will come from urban based hubs within our towns and cities utilising urban delivery solutions such as semi-powered bikes or couriers.

As the customers' trend to buy online increases, the need for distribution outlets continue to grow with a mix of "Big Box", "Mid Box" and smaller hubs. During the same year, global e-retail sales[2] amounted to 2.3 trillion U.S. dollars and projections show a growth of up to 4.48 trillion U.S. dollars by 2021. However, the shape of these centres is also beginning to change as technology enables retailers to "pick and box" with automated technology. We have seen high street grocers apply technology that adopts circa 35-40m high racking with automated cranes in each aisle picking products and bringing them automatically into "low bay" areas where final manual picking and sorting takes place.

SUSTAINABILITY REMAINS HIGH ON THE INDUSTRIAL BUILD AGENDA

As part of this new Industrial Revolution, sustainability features highly on the industrial build agenda. Distribution developers are pushing hard to become leaders with their green build credentials. Companies are looking at sustainable ways to mitigate and eventually reverse the environmental impact of their work. Many developers are now embracing methods including solar photovoltaic panels to utilise renewable energy, solar thermal to produce hot water, rain harvesting devices, LED lighting, more efficient wall cladding and natural lighting. They are engaging with the local community, opting for regionally sourced distribution to support local employment and reduce transport costs, as well as community landscaping and even insect hotels, often shared and produced with local schools and the community. This results in our buildings having targeted BREEAM and EPC ratings.

There is also a big push for increased use of electric vans and lorries to reduce emissions/ promote cleaner air quality in urban areas. In the UK we are seeing a new Ultra Low Emission Zone (ULEZ) in place in central London from April 2019 with expansion to inner London in October 2021. However, the recharging point infrastructure needs to develop and be able to respond to support this demand.

FUTURE CHALLENGES AND CONSIDERATIONS

Against this revolution of change there are various challenges for the industrial & logistics sector and for those of us working within it. As the market continues to grow to meet demand, there is an increased pressure to find and develop suitable sites in both out of town and urban locations as well as challenges around how we integrate these industrial spaces with work spaces, residential areas and other community uses to produce schemes that are attractive, functional and commercially sound. We also need to think innovatively by looking at the multi-level solution and using land efficiently where demand and land prices may be the answer. And, of course, alongside this, "institutional standards" will need to remain relevant and fit for purpose in the changing market.

We also need to future proof our designs to promote end-user flexibility as the market evolves quickly and customers' needs change rapidly. Having agile, multi-functional spaces will be key as will ensuring that the industrial and logistics units that we build are smarter to keep up with the new technology and environmental advances ahead.

As the sector continues to boom, the most important thing for us as construction and property professionals is to build for the future – with longevity and sustainability in mind rather than short term solutions reacting to the immediate demands of the market place. Those developers and retailers who do this will surely be the ones who will continue to thrive in the long term.

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[1] "Industrial Construction Sector Finishing the Year on a High." Glenigan, Glenigan, 2019, www.glenigan.com/industrial-construction-sector-finishing-the-year-on-a-high/.
[2] "Online-Shopping and E-Commerce Worldwide: Statistics & Facts." Statista, Statista, 2019, www.statista.com/topics/871/online-shopping/.

TECHNOLOGY AND COST ESTIMATING

EFFICIENCY, ACCURACY, AND RESPONSIBILITY

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Technology has rewritten many job descriptions, and that of the construction cost estimator is no exception. Not so long ago, estimators spent the bulk of their hours methodically manually extracting quantities from project drawings and tapping numbers into calculators. Now, thanks to innovative algorithms and ever-smarter software, we are able to devote more of the estimators' time to ensuring accurate pricing for clients.

Technology has liberated estimators from rolls of blueprints piled high on our desks. We can seamlessly collaborate with colleagues and stakeholders, with multiple persons able to work on projects simultaneously from multiple locations. Not only do we have more powerful analytic tools, but also vastly improved access to real-time data on pricing options that allow us to respond quicker to cost fluctuations that can affect a project. All these developments have led to increased productivity and higher return on projects.

CHANGE IS GOOD - ISN'T IT?

Ongoing tech advances on the construction side are impacting how cost estimators do their jobs, too, transforming all aspects of the process. Global positioning systems (GPS) allow contractors to accurately set excavation lines and foundations, ensure grading is being done correctly, and facilitate other site and survey work with unprecedented precision. Mobile apps let the construction team upload complete sets of project drawings and walk through the job with an iPad, identifying problems and documenting conditions live. When a project wraps up, computerized punch lists synchronize and track the progress and completion of the to-do tasks.

Building Information Modeling (BIM) is a technology that has far-reaching effects on the AEC industries, and, by extension, the cost estimator. Beginning with conceptual design through design development, then into the construction documentation phase, and extending all the way through cost management/ quantity surveying and construction and project maintenance, BIM applies a total lifecycle approach to the realization of a project.

Because BIM can detect design conflicts in the early stages of a project, it offers the power to resolve problems before construction commences. So if architects and engineers have been diligent in their detailing, there is a downstream benefit to estimators; we all know that change orders or additional work that is identified after the contractor has been awarded a project is more expensive to implement than if it had been caught it before the contractor won the job. Pricing is always better in a competitive bid environment.

But it's critical to note that the accuracy of the quantities generated by BIM software is dependent on the accuracy of the information embedded into the model. Cost estimators need to be aware that any discrepancy carries through to the resultant quantities, and ultimately the estimate being prepared. It's vital we establish and maintain new crosschecks to ensure that the end result of all this technological gain is not a loss to the client.

CONSISTENT, BUT NOT PERFECT

While we've seen that technology brings much to the practice of cost estimating, it is not without some degree of peril. Beyond a system crash, failed backup, or other technical glitch, there is one factor that poses a serious risk.

Human error - not just in matters of fact, but also in expectation - is an ever-present pitfall and stems from a deep-seated reliance on the supposed infallibility of technology. As we are increasingly conditioned to assume that what is being produced by any technology is always correct, it can be easy to forget that the information we receive from technology is only as good as the information we put into it.

For me, the most significant lesson to be learned about technology and cost estimating is not to blindly trust what the computer spits out, and to continue to rigorously run the all-important crosschecks to ensure the estimate is accurate. As technology enables estimators to respond to clients in a faster, more detailed, and sophisticated manner, clients' expectations for speedy turnarounds and precise estimates rise. It's up to us as professional cost estimators to manage data, not the other way around.

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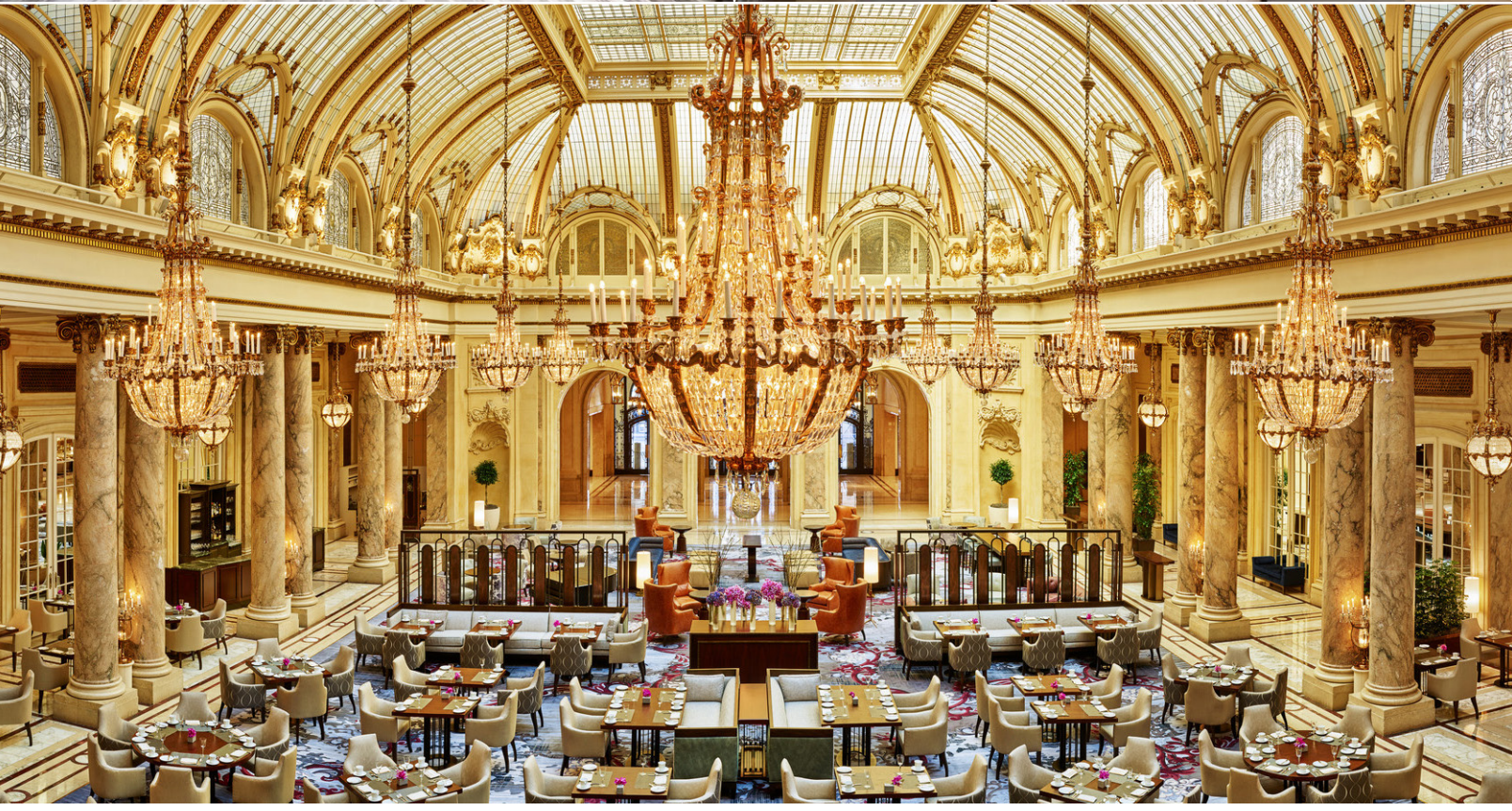
As seen in:

Construction Executive, July 2018, "Technology Brings Efficiency, Accuracy and Responsibility to Cost Estimating"

AECCafé, August 2018, "Technology and Cost Estimating: Efficiency, Accuracy, and Responsibility"



ROOMS, SERVICED:

THE KEYS TO A SUCCESSFUL HOTEL RENOVATION

Brian Lowder
Principal
North America

Hotels carefully - and vigorously - cultivate their public images. Whether it's a five-star bastion of luxury, reliable lodgings for road warriors, or a family-oriented resort, the promises of top service, irresistible amenities, and inspiring ambiance are key to generating a loyal customer base. But beneath this veneer of sophistication and civility lurks a cutthroat culture where competition for business and leisure travelers is fierce.

That's why managing a hospitality renovation is such a high-stakes operation. While the reasons for renovating a hotel can vary - to reposition the brand, add capabilities that make the property more competitive, conduct post-disaster repairs, or simply prudent periodic maintenance - hotels usually stay in operation during rebuilds, so construction must be completed as efficiently as possible, with minimal impact on the guest experience. Here are time-tested planning guidelines for achieving those goals.

WALLS *CAN* TALK

To manage such a complex project effectively, it's vital to gather as much information as possible about the building's existing conditions. For older hotels and historic properties, consulting as-built drawings - when they are available - isn't a fail-proof strategy; as the blueprint sets are often missing sheets, they are unreliable tools. With cloud-based electronic documentation increasingly replacing paper drawings, this is gradually becoming a problem of the past.

Technology can also be put to work in an on-site capacity at the outset of a hotel renovation. Using laser-powered wall scanners, it's possible to locate framing members and mechanical chases in order to create an accurately dimensioned, digital representation of a guest room.

Once these preliminary assessments are made, hidden hazards may still exist. Responsible contractors will perform an initial survey on each floor as they are shut down for the renovation to help identify these possibly dangerous situations. This "discovery phase" can expose risks such as mold growing behind wallpaper, or traces of asbestos mastic under the floor or in mirrors and at tub surrounds. Remediation plans can then be incorporated into the renovation budget and schedule.

THE PERSONAL TOUCH

While analyzing the structure itself is an indispensable way to gather information, don't overlook the human component. Interviewing the hotel's engineering staff can reveal operational problems that documents or cameras don't capture. Troubleshooting the performance of building systems, from slow-draining sinks and toilets to anemic air conditioning, will add to the body of knowledge on the project.

Why go to all this effort before starting a renovation? It's simple: To ensure sufficient funds are allocated to fix these problems at the beginning of the budgeting process. You don't want to end up spending the contingency fees to resolve issues that, with a little more up-front work, could have been factored into the plan from the outset.

Keeping the project's schedule is another reason why this preliminary work is so important. If an unexpected obstacle is encountered on site, days or even weeks may be added to the timeframe as any necessary change orders are written, approved, and finally implemented in the field.

BUILDING THE TEAM

With so many moving parts - and so much at stake - in hotel renovations, there's no substitute for an experienced construction manager. Coordinating communications between hotel operations and the general contractor is an ongoing and essential role. A decision by one group can affect all others' timelines and project budgets. For example, a mid-project scope change due to incorrect plans can lead to change orders from multiple subcontractors, in turn requiring new approvals from management and potentially causing budgetary overruns. Being proactive on the front end is the best way to ensure the project is well defined, ensuring there will be money to mitigate any issues without a significant impact on contractors, subcontractors, or the hotel ownership itself. Keeping all stakeholders continually informed will minimize those costs.

The other important team member is the general contractor, whose experience in hotel renovation should be non-negotiable. General contractors will be faced with an array of challenges, from the obvious to the mundane. They must have the know-how to deal with work that is exceptionally disruptive, such as noise from bathroom demolitions reverberating throughout the hotel. They must seamlessly manage the periodic shutdowns of systems providing water, electricity, gas, and (perhaps the most key service to travelers today) telecom/data services. When coordinating with hotel operators, they will plot wayfinding paths so that contact between guests, staff, and construction laborers is kept to a minimum.

They know the intricate dance of working room-to-room, sequencing trade workers in the most efficient and logical order to turn around floors or half-floors at a pace that maximizes the productivity of work crews. Parceling out the job in this way also establishes a kind of "early warning system": for instance, if the drywallers fall short of their daily room quota, it raises a flag about potential schedule lags and the domino effect that would impact other trades. But expectations should be realistic - overcrowding a floor with too many workers can lead to quality-control issues - and a skilled General Contractor can recognize that.

A more broad-based benefit that general contractors bring to hotel renovations is a sense of the local labor market. With shortages of skilled workers continuing to affect many cities, contractors have on-the-ground knowledge of when and which qualified subs are available. Using this information, they can give feedback on a schedule that might be too aggressive.

ROOMS AVAILABLE

More than many sectors, hotel construction is subject to regular cycles of activity. Right now, the cycle is peaking. Reflecting the number of projects in the pipeline, new hotel openings will continue to rise in through 2020. According to the American Hotel & Lodging Association, as of year-end 2017, 189,000 new hotel rooms were under construction across the country, representing an imminent supply increase of 3.7%. In October 2018, despite the opening of approximately 100,000 hotel rooms over the prior twelve months (a 2.0% increase over the prior year), the number of hotel rooms under construction remained relatively unchanged at 190,000, as proposed projects moved from the planning phase to the construction phase. As far as upgrades and rebuild projects are concerned, the Preston Robert Tisch Center for Hospitality, Tourism and Sports Management at New York University estimates that 15% of existing hotels undergo renovation each year. Proactive cost and project planning and collaborating with quality partners can help ensure both profitability and client satisfaction in this ever-evolving sector.

Brian Lowder
Principal
North America

> **“Proactive cost and project planning and collaborating with quality partners can help ensure both profitability and client satisfaction in the ever-evolving hospitality sector.”**

SIX KEY COMPONENTS
OF SUCCESSFUL PUBLIC-PRIVATE PARTNERSHIPS

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Public-private partnerships (P3s) were first proposed in the late 1990s as an approach to enhance flexibility for public entities in the procurement, construction, and management of public facilities. Since then, much debate has arisen regarding the conditions that must exist for the P3 approach to be successful. Although P3 arrangements can be used to deliver a wide range of economic infrastructure (roads, bridges, dams, electrical transmission lines, etc.) and social infrastructure (schools, hospitals, courthouses, museums, etc.), the delivery method should not be considered a cure-all for every public infrastructure development opportunity. Although each public-private partnership project is unique, there are common criteria that should be considered prior to a jurisdiction moving forward with the complex and challenging processes of a P3 procurement. Six key areas of consideration, in no particular order, for potential P3 arrangements include the following.

1. POLITICAL AND LEGISLATIVE SUPPORT

The political leadership for the area of the proposed P3 development must be prepared to provide the team responsible for procurement, development, and delivery with support at all stages of the project. Examples of support include developing enabling legislation, bridge financing for the procurement phase, and communications support. In addition, financial guarantees must be made, demonstrating the jurisdiction is prepared to make payments to the successful P3 project "special purpose" corporation (ProjectCo) for the duration of the project agreement, which could be 30 to 40 years. In some cases, enabling legislation may not be in place to allow a jurisdiction to grant a license to the ProjectCo to operate or maintain the facilities over the term of the P3 agreement. In other cases, the jurisdiction may lack the

capacity to enter into a long-term agreement with the ProjectCo, or to raise sufficient capital through bond issues to support the project from initiation through execution. These are key criteria that must be thoroughly analyzed prior to the jurisdiction moving too far forward along the road to procurement.

2. VALUE FOR MONEY COMPARED TO TRADITIONAL PROCUREMENT

A key component of a jurisdiction's readiness to move forward with a P3 is developing a business case outlining the potential benefits and risks of proceeding with the project as a P3, compared to the benefits and risks of a traditional design-bid-build approach. The value in a P3 arrangement is often derived from the economies of scale of the P3 contractor assuming operations and/or maintenance of the proposed facility. As a result, the party preparing the business case must include the cost of operations and/or maintenance of the proposed facility under a traditional procurement approach for direct comparison. Once the business case has been completed with a risk-adjusted cost comparison of the traditional approach to a P3 approach, the decision-makers are able to make a reasonable assessment of the value of a P3 approach and determine whether the risks deemed inherent in the P3 arrangement are mitigated by cost savings over the term of the agreement.

3. MEASUREMENT OF PRIVATE PARTNER PERFORMANCE

The success of a P3 arrangement often depends on the ability of the private partner, or ProjectCo, to manage the risks it assumes when agreeing to perform work on the project over the term of the agreement. This risk management approach takes the form of economies of scale during the design and construction process, or efficiencies during the operations and maintenance stage. The key success factor for the jurisdiction lies in its ability to measure objectively the work of the ProjectCo throughout all stages of the project. If the ProjectCo does not meet its obligations, the jurisdiction may be enabled by the agreement to make adjustments to the ProjectCo's payments reflecting the failure to meet contractual obligations. Therefore, a key component of a successful P3 arrangement is the presence of a clearly articulated payment (and payment adjustment) mechanism throughout the agreement term.

4. SEPARATION OF PRIVATE PARTNER PERFORMANCE FROM OTHER ACTIVITIES RELATED THE PROJECT

When deciding whether to proceed with a P3 arrangement, the complexity of the proposed project is a fundamental consideration. The jurisdiction must determine in the early stages whether the proposed project includes a significant amount of renovation or rehabilitation work, or whether the project is on a greenfield or brownfield site. There should also be a determination of whether the work of a P3 ProjectCo can be separated from other work that may not be the responsibility of the ProjectCo. We strongly recommend that the P3 project be developed with minimum complexity; complexity introduces risk, which can significantly erode the potential value for money of the proposed project, into the relationship.

5. SUFFICIENT MARKET INTEREST AND CAPACITY

The level of interest in the proposed project from the private partner community is a key success factor; the public-sector entity does not want to be placed in the position of throwing a party nobody wants to attend. Therefore, we strongly recommend that the jurisdiction engages in a robust market-sounding process prior to announcing the project publicly. This market sounding will allow the jurisdiction to determine not only the level of interest of potential private-sector partners, but also their capacity to engage in and complete the project in the manner and to the schedule specified by the jurisdiction. Market sounding is an important component of the communications strategy adopted by the jurisdiction to ensure it receives sufficient coverage and interest from the right potential private-sector partners. This exercise will also give the jurisdiction certainty on whether or not the proposed project is large enough (or small enough) to attract the appropriate private-sector partners to pursue the project. Pursuit costs for P3 projects can often be quite high; as a result, private-sector companies tend to be selective about potential public-sector partners to achieve optimum yield on their pursuit efforts.

6. SUFFICIENT OPERATIONS AND/ OR MAINTENANCE COMPONENT

The ability of the public sector to benefit from efficiencies of the private-sector partner from the operations and/or maintenance component of the proposed project directly affects the success of the project. The public-sector jurisdiction must have a clear understanding of what elements of the maintenance and operations it is prepared to transfer to the private-sector partner, or ProjectCo. In addition, the jurisdiction must clearly articulate in the agreement its expectations of the ProjectCo and the prescribed payment adjustments that will be imposed if those expectations are not met. The operations and maintenance component of the project must be sufficient to allow the ProjectCo to leverage the efficiencies that can be passed along to the public sector.

Although the above considerations are key when a public-sector jurisdiction is contemplating using a P3 approach toward developing a public facility, this is by no means an exhaustive list. A full list of considerations can only be developed through a comprehensive risk management workshop prior to engaging in the procurement process.

Considerations will also vary among project types; it is unlikely considerations for a $5 billion highway project, a $250 million school project, or a $100 million water treatment plant would be exactly the same. However, the fundamentals remain the same; the goal is for the public-sector jurisdiction to procure a public asset in a timely and cost-effective manner, while allocating the risks implicit in the project to the party best equipped to manage them. It therefore behooves the representatives of the public entity to review the above considerations as they embark on this challenging course of action.

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As seen in:
Advisor, Fall 2018, "Six Components of Successful Public-Private Partnerships"

REJournals, August 2018, "Six Factors for a Successful Public-Private Partnership"


ENTRY TO THE TRAITORS GATE

Bringing imagination to life

With a network that covers the globe and a heritage spanning over two centuries, Rider Levett Bucknall is a leading independent organisation in cost management and quantity surveying, project management and advisory services.

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