



# 360° view

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## The performance perspective

How to predict, measure and enhance the performance of major programmes across the globe.

making the **difference**

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How data can really make the difference

Welcome to

360°view

Our magazine sharing insights, innovation and best practice drawn from our experience working on the world’s most complex programmes.

**Our world is changing. Looking beyond short-term shifts in politics and markets, we are living in a new industrial age, driven by a greater understanding of our planet and the ability to develop new technologies which transform the way we live and work.**

As populations grow, governments, businesses and asset owners are being increasingly challenged to ensure environments are built to serve future demand.

Construction has a big role to play. As an industry, it is one of the largest contributors to the global economy. However, in economic terms it has the dubious honour of holding the lowest gains in productivity – performance measured as input vs output – of any industrial sector over the last 20 years.

Research has shown that construction productivity has grown just over one percent over the last two decades, compared to an average of 2.8 percent across the global economy as a whole. That equates to a potential US\$1.6tn gap in lost growth.<sup>1</sup>

**Perspectives on performance**  
In this issue of **360°view** we assess how to plug the productivity gap, offering a series of perspectives on how we can better predict and enhance the performance of projects and programmes across real estate, infrastructure and natural resources.

Starting with infrastructure, we set out how to gear up programmes for success from day one. Our interview with New York’s Metropolitan Transportation Authority then assesses the role of data to build a business case for moving essential infrastructure into the 21st century.



Experience in developed markets informs our work across the globe: in India we find a country with a huge potential for growth, but also a need to understand the unique market to guarantee outcomes.

By comparison, in the technology and manufacturing sector, we come up against the demands of an industry where agility and reliability must come first. Together in our interview with Shell, we identify how real estate can meet the demands of and shape commercial strategies.

At the other end of the asset lifecycle, we assess the state of the oil and gas decommissioning industry, taking lessons from this evolving sector to inform the performance of future projects.

Leading from these pieces, our final article takes a detailed look at the data challenge, and how we can lay the digital foundations now to drive better performance in the long term.

**A way forward**  
Enhancing performance and improving productivity is our route to ensuring that we continue to thrive despite global challenges.

Adopting the new tools, techniques and ways of working, we can make sure that the programmes and projects we work on are fit to serve the global communities we operate within, both now and in the future. □

Vincent Clancy  
Chairman and Chief Executive Officer

<sup>1</sup> McKinsey and Company, Reinventing Construction: a route to higher productivity, February 2017, p. vi



# Unlocking productivity and performance:

five steps to setting programmes up for success



**David Whysall**  
Head of Infrastructure South  
and UK Cost and Commercial  
Management

**Traditional approaches to setting up and delivering major infrastructure programmes are often wasteful and inefficient. Too many organisations don't set up their programmes in a way which will drive performance and maximise productivity. But a new generation of major UK infrastructure projects and programmes provide the momentum to deliver change.**

Many global sectors have seen declining productivity over the past 20 years. It's an issue that has long frustrated policymakers and industry leaders alike, particularly in developed economies. The productivity shortcomings of construction are well documented; the scale of the challenge and a US\$1.6tn cost opportunity to deliver change are set out in McKinsey's 'Reinventing Construction' report.

**“Infrastructure owners need to drive performance so that they can deliver best value for investors and customers.”**

Our research confirms that most major infrastructure programmes are not delivered effectively. Costs are too often at least 30 percent higher than they need to be. The causes of this underperformance are complex but if we are to enable change we need to ask: what are the traits that typically characterise these programmes?

All too often, projects fail to develop effective and adaptable operating models. People strategies are overlooked and programmes become too detached from an organisation's 'core' business. Decision-making is ill-informed because of a lack of data and analysis, and supply chain engagement is only seen as an activity at a point in time and based on a single, isolated transaction.

There's a lot at stake. Infrastructure owners need to drive performance so that they can deliver best value for investors and customers – they owe it to the people who use infrastructure every day and pay to do so. Let's also remember that major infrastructure programmes are the foundations on which the industry and its supply chain invest and are shaped. They are also a key reason that people are attracted to join the industry – it is critical that we get things right to avert a skills crisis and at a time when economic growth is in the national interest like never before. We have no choice but to get the delivery of these programmes consistently right.



### A change in mindset

The key to tackling these systemic industry issues is getting projects and programmes **set up to unlock performance and subsequent productivity**, this requires a complete shift in the industry's mindset.

From our experience, there are five steps that can dramatically change programme performance.

### Step one is the creation of a high performance environment and culture.

For all clients, this must start with the development of a fit-for-purpose operating model, which is often an extension of an existing set of business objectives. It should provide clear governance and decision-making, embrace lean principles and completely align with procurement activity and future execution strategies.

It's not just an internal framework. Clients must be clear and consistent with the external market to ensure the supply chain are aware of the value they must bring to a major project or programme and how they need to invest and adapt their own business models if high performance is to be achieved.

### The second step for all clients is to become technology enabled and data obsessed.

Investment in technology will yield benefits across the whole asset lifecycle. Technology can be harnessed to aggregate data, enable informed decision-making, measure performance against benchmarks and establish best value asset solutions. Data harvesting is key. But without the ability to translate this into information, it's impossible to set a baseline on which to deliver productivity targets, or work collaboratively with a supply chain to improve performance.

### That leads on to the third step; becoming informed about the supply chain and aligning the innovators.

High performing supply chains are the central part of driving project or programme performance. Clients need to lead by setting progressive procurement and management models that enable high performance. However, these are unlikely to be formed overnight and therefore, they should also look to invest in the market. Clients must be informed of the supply chain's capability but also prepared to develop their own industrial strategies that may shape the market in a way that will provide best value for them.

In the UK, one of the best examples of a hands-on approach to designing the supply chain is the expansion of Heathrow Airport. This programme is forging close partnerships with suppliers across the UK to build the capacity and skills needed to deliver a highly efficient project. Heathrow is targeting more productive working practices and innovation through its regional hub logistics strategy, which will also offer opportunities for the supply chain, including SMEs and manufacturers across the whole country.

Client teams need to search for the supply chain innovators, invest in them and ultimately incentivise and reward them. It's not too dissimilar from how an organisation would mine for its own talent and invest in them as part of its people strategy. Supply chains are an extension of a client's organisation.

Innovation occurs at any level in a supply chain and all too infrequently it's not recognised below tier one. The lower tiers are the real innovators capable of having a major positive impact on a project's performance, but are not sufficiently empowered or incentivised to innovate as a result of contract and commercial models which stifle it and drive down risk. The aim should be to facilitate a culture of knowledge sharing, collaborative learning and continuous improvement.

### Step four is really crucial. We need our industry to become flawless at execution and transition to a manufacturing mentality.

Boosting productivity in the build phase through offsite manufacture and the standardisation of repeatable component-led design – more akin to the manufacturing sector – will enable productivity and innovation to be embedded into projects. Again, this is a central part of Heathrow's strategy and infrastructure projects should look to work collectively and learn from other industries such as housing and hotels, where modular construction is beginning to take off in the UK. We need these techniques to be embedded, and to do this they require a sustained level of investment and to be rolled out industry wide, rather than simply on a single programme.

**The fifth and final point requires clients and supply chains to consistently outperform programme baselines.** We need to go 'above and beyond' as a standard. That's a significant cultural and behavioural shift for a construction industry that has a habit of accepting mediocre performance; often because the data hasn't been assembled to prove it. Clients need to be informed and through this be able to set challenging but deliverable baselines and measure performance over a sustained period that is likely to be way beyond the lifecycle of a single project.

Critically, this requires clients to set out a clear vision of the expected outcomes and ensure that everyone client side and in the wider supply chain understands how this supports programme success. Crossrail's mantra – "are we safe? are we on time? are we on budget? are we world class?" – summed up the performance vision and expectations perfectly and resonated with all who have been involved.

By embracing many of the measures above, Crossrail has pioneered great performance and is now seeking to share this with the wider sector through the Learning Legacy project. Progress made on skills, capacity building, performance assurance and many other areas is being grasped by infrastructure programmes such as Tideway and HS2.

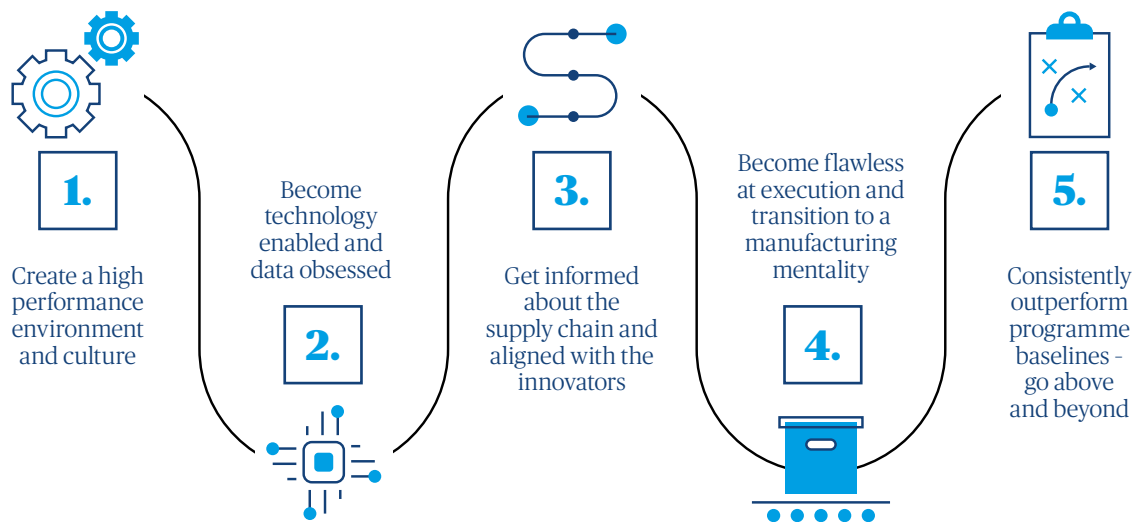
### Making it stick

With a buoyant infrastructure pipeline, we simply cannot overlook the essential elements that set up major projects for long-term success. Fit-for-purpose operating models, improved use of technology and data, embracing supply chain innovation, flawless execution and ensuring that projects outperform – these are the foundations of world-class programmes initiation.

We need to embrace the opportunity to do things differently. Following these five steps will make a difference. A new way of working is possible and in time could allow infrastructure programmes to lead the way to improved performance and productivity for the whole industry. □

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## Five steps to setting programmes up for success



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# Keeping New York moving:

## driving improvement at the Metropolitan Transportation Authority



### Client interview

**Michael Salvato**  
Director and Program Executive,  
MTA Enterprise Information  
and Asset Management

**The New York Metropolitan Transportation Authority (MTA) is working to bring ageing infrastructure into the 21st century. However, delivering future investment requires an approach that looks beyond the physical assets to drive organisational change at an enterprise level.**

Michael Salvato, Director and Program Executive for the MTA could be describing any number of organisations when he states the central challenge of his team.

“We must do more with less,” he explains. “Our mandate is to put in place a management approach that makes planning and decision-making more data-driven, transparent and, ultimately, builds a case for ongoing investment needed to meet operational requirements.” Speaking from his office in New York City, Salvato is charged with reshaping the organisational performance of one of the most highly trafficked and essential infrastructure networks on the planet.

The MTA’s transportation system underpins a US\$1.66tn regional economy, the largest and most productive region per capita in the United States. It is charged with keeping this global megacity – its businesses, institutions and the instruments of global capital markets – moving.

MTA subways, buses, and railroads provide 2.73 billion trips each year – the equivalent to about one in every three users of mass transit in the United States and two-thirds of the nation’s rail riders. MTA’s bridges and tunnels carry more than 297 million vehicles a year – more than any bridge and tunnel authority in the nation. The MTA operates the largest bus fleet, more rail cars than all other metro and commuter railroads combined, and is the largest tolling authority in the United States.

Managing a US\$1tn asset 24/7 is costly and complex. That’s why the MTA is aggressively pursuing world-class asset management to ensure that every dollar is spent wisely.

As the lead of the MTA’s Enterprise Asset Management (EAM) programme, Salvato’s role is to deliver a long-term transformation of the way the MTA manages the assets and asset systems of this expansive network to meet future challenges, and to deliver ongoing investment.

### The challenge

“There is a need to increase capacity to meet passenger demand,” Salvato explains, “while major investment like the Second Avenue Subway is required to expand the system, much more targeted interventions are needed to unlock system constraints and optimise throughput of the existing network.” The emphasis is on meeting the demands of the travelling public for a safe, reliable service and a pleasant customer experience: this is the fundamental obligation of us as stewards of a US\$1tn public asset.”

Those demands are threefold. Firstly, there is the need to manage the reliability and performance of the existing infrastructure: from Manhattan’s 100-year-old cut-and-cover subways and climate vulnerable tunnels beneath the Hudson River, to the ageing elevated railroads to the east in Queens and the iconic Grand Central Terminal and Verrazano Bridge.

The second tier is equally challenging: meeting customer expectations about how moving through one of the world’s greatest cities should feel. “There are significant obligations to modernise from the use of digital fare technology and live information feeds to delivering a comfortable journey,” Salvato explains.

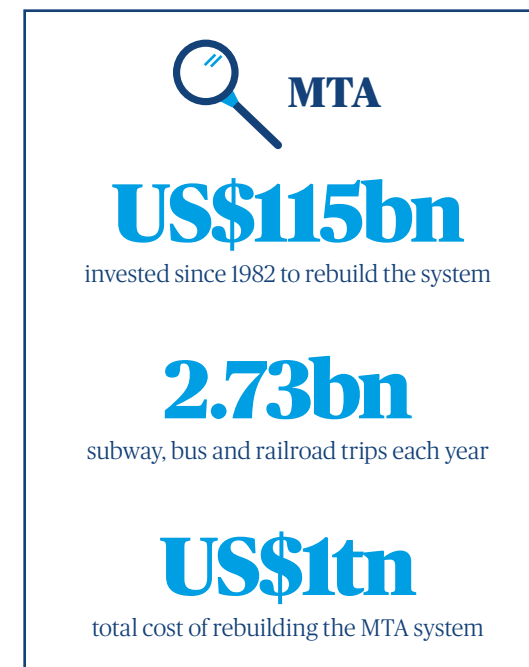
The final tier in the puzzle is dealing with the big projects: namely major capacity improvements. Over the last five years, the network has seen significant expansion, including the development of the Second Avenue Subway and the East Side Access that will bring the commuter

Long Island Rail Road into Manhattan’s Grand Central Terminal from 2023.

### Continuous investment

“The MTA is a New York State public authority made up of five core operating agencies, for subways, buses, commuter rail, bridges and tunnels, that is financed through operating revenues and city, state and federal funding subsidies,” he explains.

“We need to provide assurances to the stakeholder community – especially our customers but also state representatives – that we are efficiently and effectively using our limited resources to deliver safe, reliable services that meet the needs of the individual and the region.”





Providing these assurances, through hard data and coordinated systems, sits at the heart of the EAM: “Our capital programme needs to be financed by local, state and federal government every five years. The goal of the EAM is to provide evidence that justifies current operations and continuous investment.”

It is a case of driving asset performance through digitally enabled planning and analysis to justify investment levels essential to maintaining the existing system and meet future stakeholder requirements.

Aligning objectives

Turner & Townsend, with its partner asset management business AMCL, has worked with the MTA to set up a new ‘management system’, essentially designing the business capabilities, processes, information and systems required for managing the physical assets and systems.

A key step, explains Salvato, was to establish an asset management policy ‘on a page’ – a series of objectives that underpins all internal decision-making.

The objectives cover customer and personnel priorities – from improving safety, reliability, customer experience and organisational development – to commercial objectives of delivering value for money, sustainability and resilience, and demonstrating that MTA is compliant with all applicable requirements. Salvato explains: “The policy objectives allow us to

“From the top we establish the vision, but at the bottom tiers of the MTA we create demand and empower teams to develop their own tools and solutions.”

align decision-making throughout the organisation, from the c-suite to teams working on the tracks themselves.”

That alignment is achieved by establishing processes, data protocols and reporting requirements for the organisation which transcend individual decisions. “We build our matrices and performance statistics around these objectives and then embed them into our management system,” reveals Salvato. “This will enable us to use the data and evidence to inform decisions we make depending on whether they support the objectives.”

Winning hearts and minds

In this way, data analysis underpins the processes of the EAM, but that doesn’t mean that rolling out the programme can adopt a one-size-fits-all approach. “EAM is not a technical challenge,” says Salvato, “it is a people challenge. The nature of the organisation means that our programme has to be adaptive in the way it is implemented.”

Organisational performance therefore cannot simply be driven from board level, but needs to be adopted by all. “We have a joint top-down and bottom-up culture,” continues Salvato. “From the top we establish the vision, but at the bottom tiers of the MTA we create demand and empower teams to develop their own tools and solutions, provided that they follow our overall framework.”

Under this model, different parts of the organisation are able to prioritise areas specific to their roles. Divisions share the same basic software, which is managed centrally by the MTA’s IT team. The protocols and standards are set centrally, so that data can easily be shared and compared, but with flexibility for teams to use them in different ways.

In practice, this has allowed the Subways Department to develop a handheld tool to register and track over 500,000 signal relay devices. The Infrastructure Division are able to visually document and analyse the physical conditions of the network, and Station Teams can automate the processes for carrying out and capturing safety and cleanliness inspections.

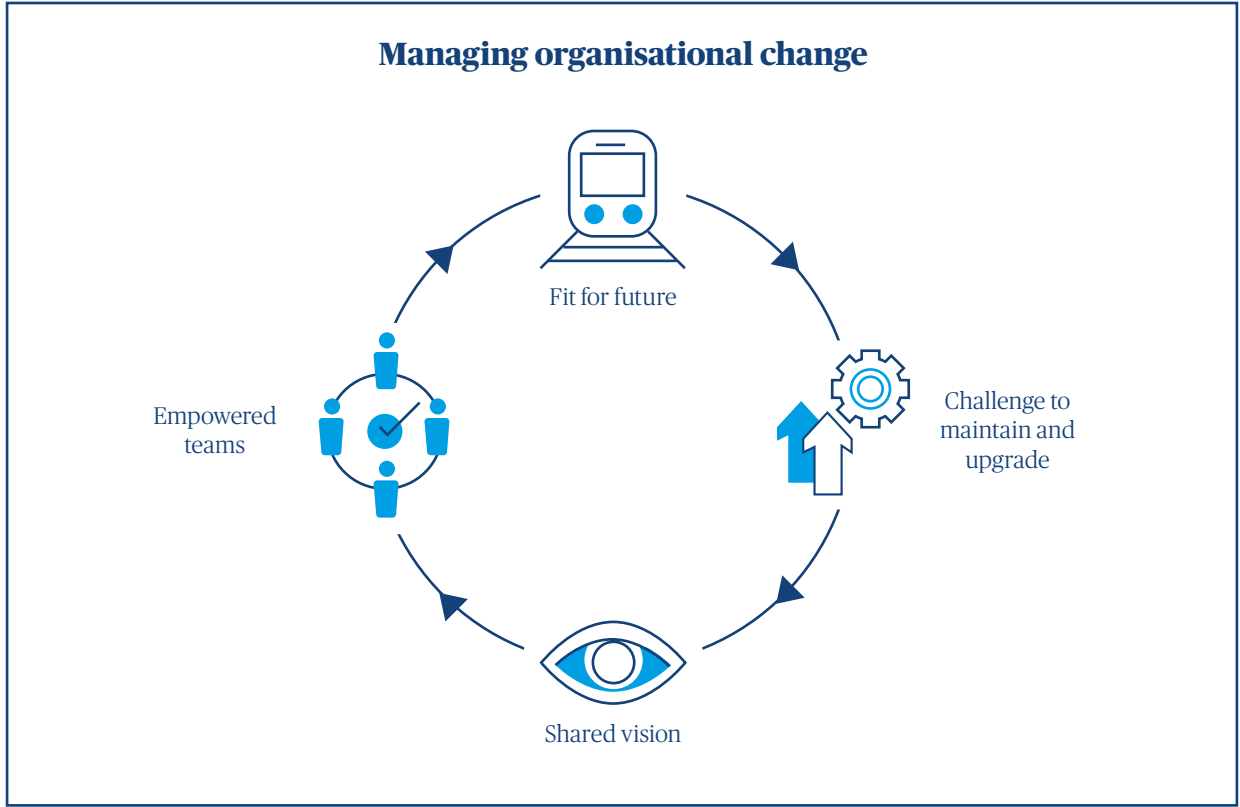
The EAM programme is installing an enterprise mobile development platform and deploying over 15,000 mobile devices to support field maintenance over the next three years. A mobility first strategy helps put the right information into the right hands at the right time from the frontline to the c-suite.



Boosting organisational performance

The success of the EAM programme lies in the creation of an enterprise approach to developing business capabilities, change management, information standards, setting budgets and establishing project stage gate and technology systems without establishing overly bureaucratic restrictions and processes.

“The challenge of a federated organisation like ours is to move from silos to an integrated model, establishing enterprise-level business processes that we agree on.” By doing so, Salvato and his team are establishing the foundations for organisational change that will deliver a smarter transportation network fit to support a more sustainable and resilient future. □





# Marking 70 years of independence:

a new chapter has begun  
in India's growth story



**Ameya Gumaste**  
Country Manager - India

On 15 August 2017, India celebrated 70 years of independence from the British Empire with vibrant celebrations across the country. The festivities provided a moment to reflect on how much India has changed and to highlight the major economic opportunities across the country today. But the Indian tiger is far from tamed, and investors should come prepared if they are to harness this growth effectively.

70 years ago, India was reeling from partition and poverty, struggling to stand on its own. Today, though social and political challenges persist, it is a country of more than 1.3 billion people supporting a GDP of over US\$2.2tn. Around half of the population is under 25 years of age and India's growth rate is some six or seven percent, making it one of the world's fastest-growing economies.

As in many high-growth emerging economies, opportunities for international investors come with significant risks. The Indian Government is pushing a wide-ranging reform agenda to address this, but in the largest democracy in the world, things are rarely straightforward. To stay on track and prevent costs spiralling, there's a pressing need for localisation, collaboration and partnership, and a certain amount of patience.

#### The scale of the opportunity

The opportunities for investment across infrastructure, real estate and construction are many. The government estimates that construction contributes some eight percent of GDP and accounts for the second largest inflow of Foreign Direct Investment (FDI).

Infrastructure generates around 50 percent of construction demand, while rapid urbanisation is driving industrial, commercial and residential development in cities: the 2011 census showed that 377 million Indians lived in cities – up 32 percent from 2001 – and this is projected to rise to 590 million by 2030.

#### From emerging economy to Indian tiger: government reforms

Investors may also be encouraged by the steps taken by the government to attract inward investment.

Since his election in 2014, Prime Minister Narendra Modi has led a multitude of government programmes that prioritise manufacturing, technology and entrepreneurship. From Start Up India and Skill India, to Make in India, a major inward investment initiative which aims to boost manufacturing to 25 percent of GDP by 2022. This includes the creation of five industrial corridors – such as Delhi to Mumbai – to facilitate industrialisation and planned urbanisation.

Rapid urbanisation brings with it challenges of overcrowding, pollution, poverty and inadequate infrastructure and housing and the government has



#### India: growth potential in numbers

Fastest growing  
economy in the G20

**1.6+bn**

estimated population by 2050

**US\$650bn**

estimated investment in urban  
infrastructure over the next 20 years

**8%**

growth rate in construction

**3rd**

largest construction market  
in the world by 2025

**590m**

urban population by 2030





recognised the need for centralised planning and controlled development to create productive cities.

The 'Smart Cities' programme is selecting 100 cities in which to deliver improvement (retrofit), renewal (redevelopment) and extension (greenfield development) projects, alongside pan-city initiatives applying smart solutions in areas such as sanitation, waste, energy, connectivity and health.

#### 'Ease of doing business'

The government has taken many steps to improve India's ranking in the World Banks 'ease of doing business' index. Conscious and determined efforts have yielded positive results and India now ranks 100th, a substantial improvement since last year.

Government is driving reform here too: in July, India implemented one of the most radical tax reforms in its history. The Goods and Services Tax (GST) replaced a rabbit warren of indirect and state taxes with a single national tax, while also reducing the number of tax rates and creating uniform compliance processes.

Likewise, there are barriers to growth in the real estate sector. Earlier this year, it enacted the

Real Estate Regulation Act (RERA) to streamline the bureaucracy surrounding the industry. This followed further liberalisation of FDI rules in 2014, which now enable 100 percent FDI for development and infrastructure.

Implementation of these reforms will be a bumpy ride and there remain a number of priority areas where investors should take action to manage risk and ensure good performance.

#### Diversity, bureaucracy and technology

The GST may have created a single market, but India is far from homogenous. With 29 states and 22 official languages, India can be a challenging place to work even for internal migrants, let alone overseas businesses. Top of the list of obstacles in construction is the complex permit system.

India has some 34 procedures across multiple departments including environment, development control, engineers, road, fire, water, public health, local statutory bodies and many more. It takes an average of 196 days to acquire construction permits. RERA may improve this, but it remains important to allow adequate time in programme and project plans,

and to work with an established local compliances agency to process permits efficiently.

Investors should address these combined challenges through close collaboration and by developing an in-depth understanding of local market conditions. A series of linked business and project plans should be created and appropriately localised, accounting for both regulatory and cultural differences.

International expertise has a role to play alongside local knowledge. Mechanisation has made huge progress in India in recent decades, but the full incorporation of modern technology to boost productivity in the construction process is still some way off. New techniques, which are yet to become standard even in developed markets, hold huge potential to drive performance. Working with international consultant partners can help by facilitating knowledge transfer across borders.

#### Collaboration and patience

One of the downsides of India's growth acceleration is that the supply chain has struggled to keep up.

Tier one contractors tend to be available only for the largest projects and overseas contractors have struggled to succeed in this market. As construction has expanded, skills gaps have emerged and there remain tendencies to do things informally, rather than through structured procurement.

A robust contracting strategy will plan for such hurdles, and providing support and supervision to tier two and three contractors will help ensure health and safety, quality, programme and budget stay on track.

Collaboration is vital. Contracts are generally not well-enforced and it's important to work with contractors to help them prepare for all possibilities. Early efforts on scheduling works and assessing materials and labour availability will pay dividends later.

As these challenges suggest, patience is also a key ingredient. Investing in India is exciting, but it's a complex market for new entrants and quick returns are hard to come by. Investors should be prepared to think long term, where the greatest rewards lie.

India's scale, vibrancy and dynamism are undeniable – it's a market Turner & Townsend has been part of for ten years and the country is only going to play a greater role in the global economy in the future.

After 70 years of independence, India has never been so open to the rest of the world, but entrants should come ready to adapt, collaborate and join us for the long haul. □

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### 100 Smart Cities - in brief

1.



US\$7.5bn estimated government allocation for the Smart Cities programme

2.



96 million estimated urban population to be impacted by Smart City projects

3.



Smart solutions could range from intelligent traffic management systems to waste water recycling and smart metering

4.



Challenge method - cities are selected through state and national competitions

5.



90 of 100 selected so far - stretching across India from Ahmedabad to Aizawl

6.



Special Purpose Vehicles set up for every Smart City, each with a CEO and Board

7.



Funding sources - range from national and state government, to PPP projects, municipal bonds, user charges and others

8.



Early days - most projects are still in their infancy



# Real estate as an asset, not a liability:

shifting perceptions across  
global manufacturing



**Bernhard Brandstetter**  
Director - Germany

**Geopolitical dynamics, changing consumer demands and the globalisation of supply chains are all reshaping global manufacturing. Real estate models need to reflect the pace of change, adopting a data-driven approach to support and drive business decisions.**

In today's global marketplace, manufacturers face new trade-offs. Where to locate production facilities? How should products be manufactured? Who will be performing the work? What level of automation should be used? What role can digital technology play to improve operations?

Global real estate strategies must be flexible to support investment into new markets, keep operating costs at a minimum, rationalise and consolidate portfolios following mergers and acquisitions, and make informed decisions about legacy properties at the end of their lifecycles.

However, real estate for some global organisations can be perceived as inflexible. It can be viewed as a barrier to fast-changing operating models and a 'cost adder'.

This is undoubtedly a challenge for global real estate portfolio managers. They need to deliver the right space, in the right place, at the right time to meet commercial need. But whereas operational or product

“Global real estate strategies must be flexible to support investment into new markets, keep operating costs at a minimum, rationalise and consolidate portfolios following mergers and acquisitions, and make informed decisions about legacy properties at the end of their lifecycles.”



cycles for a manufacturing business may run for two to three years, a property lease will stand for much longer, creating a potential disconnect between the business' objectives and its real estate obligations.

#### Data disconnect

Bridging this gap relies on experience and expertise to make good, data-backed decisions. Real estate must be a service provider for a manufacturer's commercial and production strategy. This means a clear picture of the make-up of a global real estate portfolio – the age, location, size and cost to build and maintain assets is vital.

The lack of a clear global dataset is often a barrier to success. In our experience, the nature of global portfolios and real estate markets is such that information can be difficult to standardise; cultural differences, measurement and lease arrangements, and decentralised teams with differing skill sets can make it difficult to assemble and rationalise the key information to enable site comparisons and ultimately make informed decisions.

Because companies are not recording or do not have access to historical data, they may struggle to measure individual properties' benefit to the bottom line. Without an accurate dataset it can become difficult to understand legacy buildings and whether they should be disposed of, or if there is scope to repurpose them for a new commercial use. Consequently, decision-making can be ill-informed.

All too often global estates are not consolidated and rationalised expediently following mergers and acquisitions. There are incidences where a merger between global manufacturing companies can result in two facilities in the same city, and a lack of data about individual properties can impede the decision-making process when it comes to asset disposals.

“Because companies are not recording or do not have access to historical data, they may struggle to measure individual properties' benefit to the bottom line.”

#### A framework for success

Global real estate teams need to respond by establishing a global framework for recording information about the asset and its performance in a way that is accurate and consistent across multiple sites and regions. The aim should be to develop a standardised approach to building and operating facilities which makes data king.

The detailed requirements of any data-led strategy will need to closely reflect the priorities of a specific business. The essentials may seem obvious – to accurately identify the performance of physical space we need to know the constraints associated with real estate, including its size, location and lease commitments. However, to support an agile manufacturing business we also need to dig further. How could the space be adapted to suit new product lines? Would the utility infrastructure support new power requirements?



#### Optimising workspace, boosting performance

Turner & Townsend's Munich team has developed a real estate tool which harvests data to manage workplace transformations and help to inform real estate strategies.

The innovative tool can simulate optimum workspace and uses data to consider space requirements, location, proximity to departments and current and future headcount by mapping information against floorplates within a building.

On behalf of a global premium car manufacturer, we used the tool to strategically reconfigure their manufacturing facilities with a focus on productivity.

Having accrued this data, a strategy and framework for analysis needs to be established which can combine with commercial insight on the ground to inform decisions about how the portfolio should be managed. This could include decisions on where to locate new manufacturing lines as well as whether to rationalise or extend portfolios.

#### Shaping business strategy

With detailed understanding of the data, companies can benchmark across regions to generate insights about how the portfolio can better align with wider business drivers. While real estate teams need to act as the owners of data, they need to demonstrate how it can be used at board level to manage operating costs and drive asset performance. In this way the case can be made for real estate as an asset and not an overhead.

We recently helped a global semiconductor company to assess its four global sites and respective facility management approaches in order to reduce waste and facility downtime. By combining site data with our understanding of manufacturing and the client's operations, we were able to consider hard and soft facts about each site, identify key issues and risks and set out a best practice approach for each facility to adopt.

Manufacturing business models are undergoing profound change and this is bringing both new challenges and new opportunities for real estate portfolios. Real estate teams therefore need an improved global understanding of their assets, which must be underpinned by a dataset to measure the cost of building and maintaining facilities in different regions. Improving speed to market is a fundamental benefit, but this approach could open many other key benefits in the future. □

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### Enhancing portfolio performance



A stepped approach with increasing levels of data employed enables prioritisation



Insight visibility, prioritisation of the next steps



Understanding the dynamic of the portfolio



“

# The art of the possible:

how Shell Real Estate turned global challenges into operational success



## Client interview

**Jaco van Noppen**  
Vice President for Operational Excellence, Shell Real Estate

Since 2015, Shell has been operating in a rapidly changing environment. As well as adjusting to “lower for longer” oil prices, it has delivered one of the largest M&A deals in history by acquiring BG Group. Yet in the face of challenging circumstances – including a full organisational restructure – Shell’s Real Estate division has created new opportunities and boosted performance.

According to the Vice President for Operational Excellence at Shell Real Estate, Jaco van Noppen, the convergence of these challenges brought some great opportunities. “One could say we had time on our side”, he explains. “It meant we were able to jointly identify the most effective operating models, share best practice and work out how 80 additional locations used by Shell and BG could be integrated.”

Shell Real Estate is responsible for providing a safe and productive working environment for 90,000 Shell staff worldwide. Managing all non-hydrocarbon assets – from offices and business operations centres, to technology centres, and even homes – Real Estate holds a portfolio valued at US\$20bn and with an annual spend of around US\$1bn.

### Supporting the Shell vision

Van Noppen’s team was established in 2016 as part of a major re-organisation which aligned Real Estate with the wider Shell business and created the Operational Excellence function.

“Our biggest project is Real Estate’s Vision 2020 strategy,” he says, “which aims to deliver US\$2.5bn in value to Shell between 2016 and 2020. The strategy is not only about cost reduction, but also very much about avoiding costs and creating business value.”

“Real Estate is not a goal in itself. Around 2015, the oil price dropped from US\$100 per barrel to US\$50, which has had a tremendous impact. It falls to Real Estate as a function to provide new, cost competitive solutions and identify how to create value.”

The Real Estate organisation is now working with around 700 Shell staff and 6,000 contractors to embed three principal objectives: improved business partnering; cost competitiveness and leveraging the right data for decision making.



## Shell Real Estate in numbers



# US\$20bn

value of the Shell Real Estate portfolio

# US\$1bn

annual Real Estate spend and US\$300m in capital expenditure

# 700

Shell staff

# 6,000

Contractors

# 90,000

Shell staff make use of Real Estate serviced locations worldwide

# 46 countries

Shell portfolio reach

### Creating a data culture

"One of the reasons for raising the Operational Excellence team has been about establishing 'one version of the truth' for data," says van Noppen. "This process began with setting clear strategic goals for the collection, management and analysis of data and a step-by-step roadmap for change."

A global Project Management Office (PMO) was set up and managed by Turner & Townsend to support the Operational Excellence programme. Working with this office, Shell introduced a programme of coaching, stakeholder management and key performance indicators, combined with new compliance processes to provide assurance of 'data quality'. These improvements were brought together with visualisation software to develop graphics and dashboards for senior management, enabling leaders to make faster, more effective decisions and drive forward the performance agenda.

With improved data capabilities, the Operational Excellence team now has the ability to assess the performance of a project against expectations at any point during its lifecycle using the PMO's Health Check tool. To date, over 250 health checks have been undertaken globally, with the average project score rising from 55 percent to 91 percent since 2015.

"People are far more focused on the importance of data – its completeness, accuracy, timeliness, integrity and thus its overall quality," van Noppen highlights. "We have better-than-ever visibility of the capital expenditure and cash flow for projects. As a result, we have seen that decision making is faster and better than before."

"Now, we're looking at moving from historical, background reporting to more predictive analytics – which is the ultimate goal and where we can really get ahead of the game."

### A passport to performance

The introduction of improved assurance processes extends far beyond data. The supply chain is another area, fundamental to driving forward the performance agenda and Shell and Turner & Townsend have focused on proactively engaging supply chain partners.

The PMO has pioneered the Skills Passport, a system that ensures partners comply with Shell's processes and standards. The passport has been used to deliver on-boarding, training and compliance in areas such as health and safety, with reporting via monthly video conferencing.

## Shell Real Estate and Turner & Townsend: partnering to deliver a Global Project Management Office



# 25

year relationship between  
Shell and Turner & Townsend

# 2015

Turner & Townsend commissioned  
to launch Global PMO

# 900+

members of the supply chain assured  
using the new Skills Passport

# Safest year

in Shell Real Estate history in 2016

# 55% up to 90%

improvement in data compliance to date



"Last year, we had the safest year in Real Estate's history, which the Skills Passport clearly contributed to" reports van Noppen.

Since 2015, more than 900 members of the supply chain worldwide have been engaged, upskilled or assured through the Skills Passport. This is enabling Real Estate to make informed decisions on appointing providers and to develop 'benches' of supply chain capability to mobilise projects efficiently.

"It's helping them to understand Shell," van Noppen says. "On interior design standards, for example, the supply chain needs to be aware of the standard, but also understand its flexibility so that we don't have a homogenous outcome all over the world without regard to the local context."

### Global outlook, local outcomes

Across all value streams, Operational Excellence is working to align global and local perspectives to improve performance – bridging gaps between project managers and regional teams on the ground, and the strategic Real Estate function.

These improved relationships, coupled with far greater understanding of the portfolio worldwide, mean that the position of Real Estate within the Shell business is changing in a positive fashion.

"As a Real Estate function, we're better informed and better prepared for business conversations, both internally and externally," says van Noppen. "In a negotiation, we are seen as a more serious partner because we have enhanced market knowledge. Within Shell, we know how people are using the Real Estate portfolio, how people behave in our assets, and we have a greater understanding of what the demands are. It's a totally different approach, rather than receiving requirements from other parties and delivering projects, we think and act ahead as more professional advisers to the business."

Shell Real Estate has achieved this new status through a holistic programme of change. Despite the global challenges facing the business, as van Noppen says, "our journey shows that focus on costs can come hand in hand with improved performance." □



# Decommissioning:

## under the performance spotlight



**Andy Aston**  
Managing Director, Global  
Natural Resources



**Aileen Jamieson**  
Director Natural Resources and  
Global Head of Downstream

**Ageing assets require oil and gas operators to make informed investment decisions: financially commit to late-life asset management or start to decommission in a safe, environmentally sound and cost-effective way.**

Over the next decade, 183 projects in the North Sea and Norway are forecast for decommissioning with 100 platforms set for partial or complete removal, 1,800 wells plugged and abandoned, and 7,500 kilometres of pipelines decommissioned.

*Oil & Gas UK* has previously warned against 'premature decommissioning', with up to 20 billion barrels of oil and gas said to be still recoverable from the UK's North Sea. It has stated that the remaining value of fields nearing decommissioning in this region could increase by more than 50 percent if there were successful measures to reduce costs and increase production.

Likewise, the *UK Oil & Gas Authority* has called for the improvement of life extension techniques through its maximising economic recovery (MER) initiative, while increased pressure from the UK government has tempered spend and encouraged life extension programmes. Operators themselves are lobbying for incentives to enable asset transfer from the oil and gas giants to small, leaner operators.

Despite these factors, a sustained low oil price has nevertheless focused the minds of many operators on the potential for decommissioning. Previously, high prices and advanced technology supported the case for extending field life, but in today's environment it is more difficult to justify escalating maintenance costs and declining production.

The low oil price has driven OPEX reductions, but the choice between life extension and decommissioning remains in the spotlight. This is a particular challenge on the UK continental shelf, where many platforms are reaching their later life and operating long past their initial design expectations due to life extension work.

“Previously, high prices and advanced technology supported the case for extending field life, but in today's environment it is more difficult to justify escalating maintenance costs and declining production.” →



### What factors are affecting decommissioning performance?

While decommissioning projects have been successfully delivered for many years and cost data has been collected, a number of external market factors mean that it is now more difficult to define and benchmark exactly what good performance looks like in this evolving sector.

### Low oil prices

Firstly, the low oil price has contributed to significant decreases in supply chain costs, with the cost of labour and vessels now much lower than when oil was priced at US\$100 a barrel.

In the UK there is a concerted drive to reduce costs further. The *Oil & Gas Authority's* Decommissioning Strategy for platforms on the UK continental shelf is focused on delivering a 35 percent cost reduction by 2020 in a technically competent, safe and environmentally responsible manner.

It estimates an overall decommissioning price tag of £59.7bn (US\$77.5bn) based on 2016 prices, but if a minimum 35 percent cost reduction can be applied, the total cost of decommissioning could come down to £38.8bn (US\$50.6bn). This strategy is also seeking to boost supply chain expertise and capability to unlock further efficiencies, as well as providing British companies with a competitive and exportable skill set to unlock work in other parts of the world.

However, recent cost analysis by Turner & Townsend's Performance Forum has indicated that the bottom of the market was reached around Q3 2016, which ties in

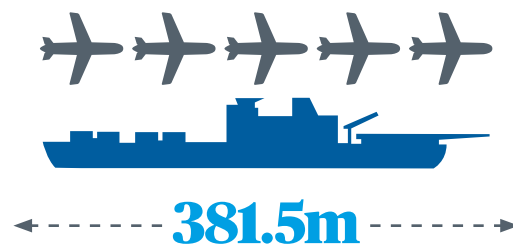
with the general industry perception expressed by our clients that costs are back on the rise. Operators are, once again, examining new-build projects and these may compete with decommissioning projects, thus impacting on the supply and demand of both people and vessels.

### New technology

The launch last year of Allseas' *Pioneering Spirit* is a potential game-changer. The largest construction vessel in the world, it is capable of transporting the entire topside of a platform or the steel jackets underneath, before taking them to shore for dismantling, reuse and recycling of materials.

The super vessel – which is the length of five jumbo jets – was used to cut and lift Shell's Delta Platform topsides (24,000 tonnes) in the North Sea Brent oilfield and undoubtedly reduces the time to decommission – but there is not yet industry data available to assess its cost performance.

### The super vessel length



### Performance facts

Research by the Performance Forum, managed and operated by Turner & Townsend reveals:

## 140 years

Plugging and abandoning 1,800 platform and subsea wells in the UK and Norway, with only one drill rig employed, could take as long as 140 years to complete at an estimated cost of £12-15bn

## £10.5m

To plug and abandon an individual subsea well costs on average around £10.5m per well and £3m for a platform well

## 4 weeks

On average it takes four weeks to plug and abandon a well, however this can range from seven days to 70 days.

### Inconsistent approach

Finally, there is not a single, consistent global approach to decommissioning. The reality is that this may never be realised; differing environmental and legislative regimes together with varying economic drivers are almost certain to prevent consensus. In the UK, Norway and the USA, policymakers have set out clear guidelines as to how operators should deliver projects, but in many other markets such as India and China there is likely to be a less prescriptive direction.

### How operators should respond

Against the backdrop of an emerging decommissioning industry, cost data on decommissioning projects should be used to inform not only the design and engineering of new-build oil and gas assets, but also operators' business models and execution strategies.

A traditional project approach may not be appropriate for decommissioning and many operators have a lack of experience in this field, which increases the risk and uncertainty in their projects. Developing fit-for-purpose planning and cost estimating processes will be required to improve predictability of costs and setting the right strategy for success.

Operators will need to collaborate to optimise the execution of projects and stimulate greater efficiency. At the same time, a new focus on allocating risk and reward is required, which means operators must work in collaboration with the supply chain. When performed effectively, risk transfer allocates risk parties according to their ability to control and insure against it. However, transferring risk from owner to contractor is not always the most effective option and incorrect risk allocation in a contract can result in delivery failure and bring new risk of a contractual claim.

If decommissioning does accelerate, it will drive an increase in supply of drilling rigs for P&A operations and costs could decrease. The supply chain will be driven to find new ways to make the process more efficient and we should expect further innovation.

Finally, the industry really needs to increase its efforts in collecting more data to enhance the knowledge base to allow more informed engagement between operators, regulators, stakeholders, peers and the supply chain.

The projects completed now must help to inform client decision-making and our collective understanding of the performance benchmark for future projects. What we learn now about assets reaching the end of their life will help us to better prepare for the next generation of projects on the horizon. □

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# Seeing the wood for the trees:

how data can really make the difference



**Tom Deacon**  
Global Head of Digital

**Data, analytics and digital technology are often heralded as the silver bullet to improving productivity in construction. They have the potential to drive immense benefits, but are only part of the picture. So where should we start?**

The construction sector has been slow to embrace new technology and digital tools compared with other industries. While manufacturing and more recently tech businesses have adopted the recording, measuring and analysing of productivity as standard, the construction sector – across real estate, infrastructure and natural resources – has too often failed to keep pace.

There's no doubt that the industry has woken up to the need to modernise. Faced by shortages of resources and skills to deliver projects through traditional means, as well as pressure from asset owners to demonstrate enhanced value, the sector is now facing up to the digital challenge – and finding that in many cases it has a mountain to climb.

Data is critical to improving productivity in construction. We are constantly reminded that accessing and harnessing big data is the future for our industry, but there is still uncertainty as to how.

The answer lies in a very traditional aspect of construction: building firm foundations. Before we start implementing big ideas, we need to make sure we have the basics in place across our sector which will help us drive efficiencies in the long term.

#### **Tackling the basics**

Put simply, the first step is to understand what we want to measure and how best to measure it. This means ensuring that an information and data strategy is established from the outset of a project. Such a strategy should set out how we want data to be standardised, supplied and recorded, so that information on one part of a project can be easily compared to another.

We need to specify the digital asset as well as the physical asset in advance. Achieving this will require us to break down some ingrained barriers to create better visibility and more transparency across the supply chain – fostering a collaborative approach where members of a project team share information freely.



The onus does not lie solely with contractors and consultants. The most evident way to achieve better information collection is for clients to place great emphasis on data at the contractual stage to ensure that a clear framework is in place. This should include agreed obligations to standardise and share information on the project. Often, the asset owner needs to take the lead to bring the supply chain with them on their data journey – articulating the benefits that such an approach will deliver for the whole project and encapsulating them in a collaborative contract.

A good example of such an approach is Network Rail's redevelopment of London Bridge station, where contracts have been set up with a clear framework for sharing information to deliver a near-live reporting environment. Requiring the supply chain to feed in data to the project team in a timely and standardised way allows for almost real-time updates. This has enabled better management of labour and costs for all parties through, for example, reduced rework and earlier interventions.

#### Aggregating data to inform decision-making

On a project-by-project basis, an agreed approach to data collection and sharing can help to better manage resources, deliver greater certainty and maintain consistent performance. However, it is when we step beyond an individual project and look at the potential to shape decisions across major programmes or large infrastructure networks that the value of establishing these basics become clearest: when we move into the realm of big data.

In the UK, the Department for Transport (DfT) is in the process of adopting consistent data standards for measuring cost across the whole transport network. This is enabling it to better shape future delivery through more effective 'whole life value' planning.

Likewise, there can be significant benefits for global real estate portfolios. Delivering greater visibility and consistency of data means that asset owners can more accurately forecast demand, cost and value of investment. Through access to 'fit-for-purpose' data across a global set of data points, it is possible to create parametric cost models and indices and generate accurate early cost estimates.

This has driven our work to develop a Data Centre Cost Index – a global benchmark which can be used to shape investment decisions in this global industry. The index aggregates construction information on data centres in different regions around the world to capture the relative costs. If the construction costs of a facility in one region are known, the index can be used to estimate costs in another region. Better data can provide greater surety of outcomes in a sector that relies on agility and speed of delivery to meet the demands of its customers.

### The Data Centre Cost Index: need to know

Turner & Townsend's Data Centre Cost Index, which will be published globally December 2017, assesses the relative cost of data centre construction across 18 global markets.

Based on a comprehensive assessment of labour and material costs, it allows accurate benchmarking to support location planning and portfolio expansion.

In natural resources, we are seeing effective use of data through our work with the Performance Forum. We have led the continual development of this group of oil and gas operators since 1994. The Performance Forum has established greater visibility of upstream project performance information across the oil and gas industry worldwide. By securely handling data from across the sector and anonymising it, we are able to gain greater visibility of cost, schedule and technical performance for projects across multiple regions, while at the same time preserving the security and interests of the businesses operating in the sector. These are just some ways that setting up good data practices can drive performance.

#### Developing new tools

Establishing better data standards will help maximise the value of tools like BIM, which is yet to be fully integrated into our industry. Helping BIM to support collaborative design and construction through the use of transparent data-sharing practices can help it achieve its full potential. 'Better Information Management' supports the creation of a digital 'twin' of a physical asset which can be used to model, predict and shape decisions not only during the construction phase, but also in planning, operation and asset management.

This relies on maintaining the data-sharing approach that was established at the start of the project and continuing it across the asset's lifecycle – monitoring, recording and assessing data on operational

“Establishing better data standards will help maximise the value of tools like BIM, which is yet to be fully integrated into our industry.”

performance. In this way, we gain a deeper understanding of a building or piece of infrastructure which enables us to manage costs, identify risks and drive productivity in day-to-day performance of the asset.

#### Digital first

These and many other rewards are available to our industry if we can get a grip on data and use it to drive performance for assets, their owners and our own businesses. We need to adopt a 'digital first' mentality across everything we do.

**To drive transformative change and realise the true value of data, the industry needs first to take a step back and make sure we're getting the basics right. □**

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### How data can drive productivity:



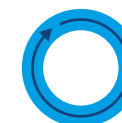
Enhancing collaboration across the supply chain



Managing better the resources, labour and costs on a project



Forecasting demand, cost and value of investment



Understanding assets to manage lifetime performance





Turner & Townsend is an independent professional services company specialising in programme management, project management, cost and commercial management and advisory across the real estate, infrastructure and natural resources sectors.

With 104 offices in 44 countries, we draw on our extensive global and industry experience to manage risk while maximising value and performance during the construction and operation of our clients' assets.

**[www.turnerandtowntsend.com/performance](http://www.turnerandtowntsend.com/performance)**

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