



INSIGHT

The global infrastructure magazine | Issue No. 8 | 2016

Infrastructure Morality

Delivering on the UN's SDGs

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#inframorality



Foreword



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As a sector, we talk a lot around the morality of infrastructure. But we do not use those words. Instead, we talk about affordability, social benefit, development and access. And we aim to improve the morality of infrastructure through programs under an equally diverse set of themes — social responsibility, active investing and transparency, to name but a few.

Yet — until today — no one has really stopped to consider how all of these trends, ideas and initiatives combine and coalesce to form a sense of ‘infrastructure morality’. There are no books or guidelines on infrastructure morality; no training courses or seminars to dictate what is right and what is wrong. As a result, it is often left to governments, investors, policy makers and developers to puzzle out what is morally acceptable and what is not.



That is why we are particularly proud of this edition of *Insight* magazine. Within these pages, we have focused on tackling some of the hard issues — flash-points such as migration, corruption, social equality and affordability. And we have asked difficult questions of infrastructure leaders and executives at the forefront of the moral debate — Brazil's construction leaders, Bangladesh's PPP executive and the Director General of Kenya's Vision 2030 initiative, for example.

What comes through clearly is that there is, indeed, a growing appreciation of the moral dimensions of infrastructure. And it has deep implications — risks and opportunities — for infrastructure owners, government, the public, developers, operators and investors alike. We hope that this edition of *Insight* catalyzes a new and deeper view of infrastructure morality which, ultimately,

leads to a better world for us, our children and our grandchildren.

This edition of *Insight* magazine also contains our *Special Report on Asset Delivery*, a discipline that has become increasingly important as infrastructure owners and operators strive to deliver improved capacity and customer service to users. As the articles in this *Special Report* illustrate, much has changed in the field of asset delivery over the past few years; anyone seeking to enhance the productivity of their assets will find this section a valuable read.

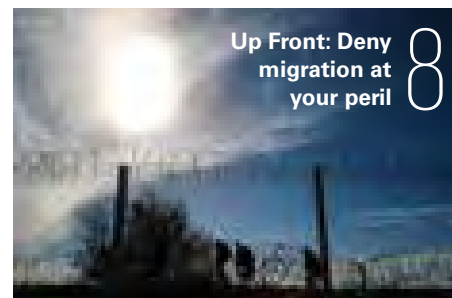
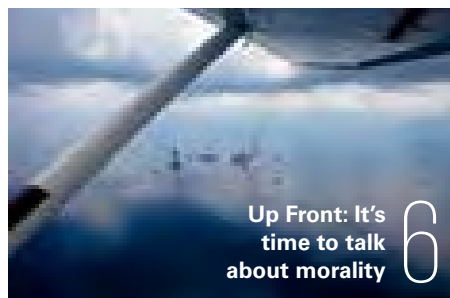
Of course, there are always exciting projects and ideas emerging in the world of infrastructure. And this edition of *Insight* contains a number of other articles certain to interest infrastructure participants. From our discussion with the CEO of Hyperloop

One through to our interview with the head of the G20 Infrastructure Hub in Australia, this section of our magazine highlights important ideas and themes from across the infrastructure sector.

On behalf of KPMG's global network of infrastructure professionals, we would like to thank all those executives and leaders who contributed to this edition of *Insight* magazine. We believe that the issues and themes that we have explored together in this publication are vital to the success of our sector and central to creating a just society for all.

To explore any of the themes identified in this publication — or to discuss your own unique infrastructure challenges — we encourage you to contact your local KPMG member firm or any of the authors who contributed to this magazine. ■

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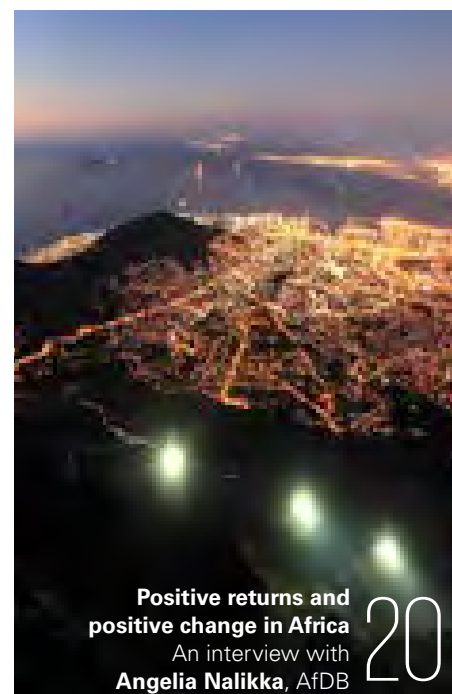
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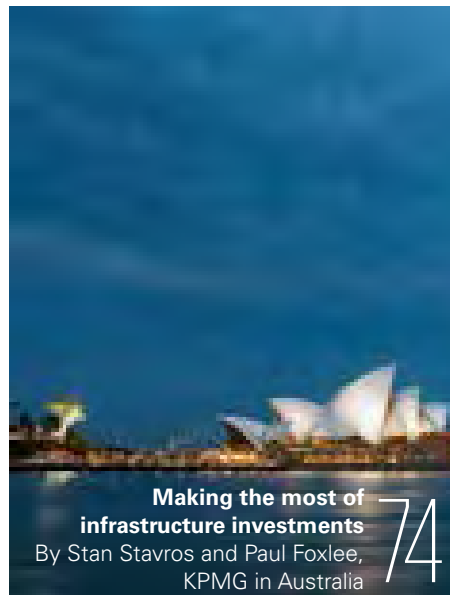
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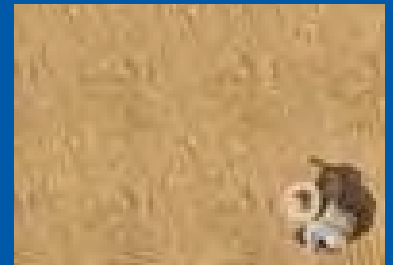


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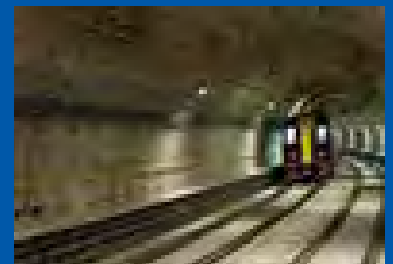
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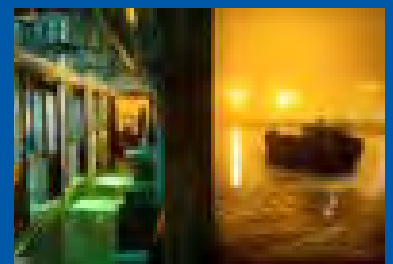
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Around the world in infrastructure

Europe

The European Union

EU rules spur airport privatizations

With just 7 years left before the European Commission's state-aid rules for airports come into full effect, governments across the EU are starting to think about whether they want to either privatize their airports or focus on regenerating them into profitable, stand-alone enterprises. France recently privatized the Toulouse Blagnac Airport and has indicated intentions to do the same with state-owned airports in Lyon and Nice.¹ In Germany, the loss-making Frankfurt Airport has entered talks with Chinese investors.² Expect to see more privatizations and M&A activity ahead of the 2023 deadline with significant interest coming from outside the region, namely from China and Canada.

The Baltics

Rail Baltica gets back on track

Almost 15 years after it was first mooted, it seems the ambitious Rail Baltica project may be back on the drawing board. The proposed EUR5 billion, 730-kilometer high-speed rail link from Tallinn, Estonia to the Polish border (via Latvia and Lithuania) would add a welcome North-South connection through the Baltics.³ But while the respective governments seem keen, challenges getting everyone to agree on the right governance, structure and procurement procedures are raising concerns about reaching final agreement. Integrating the rail line is also key, and will require the former Soviet States to convert their rail network from the current Russian system to the standard EU high-speed rail system⁴. Eighty-five percent of the project's cost are expected to be covered by the EU with the remaining 15 percent covered jointly by the three Baltic nations.⁵

Slovakia

A home for Hyperloop

With no real prototype or commercial product yet, Elon

Musk's Hyperloop concept has already found a potential first customer in Europe. Hyperloop Transportation Technologies (one of a handful of companies seeking to commercialize Musk's idea) has signed a Memorandum of Cooperation with the Slovak Ministry of Economy.⁶ A feasibility study is now underway to assess the potential of linking Vienna (in Austria) to Bratislava (Slovakia's capital) by 2020, shortening the journey time from one hour to about 8 minutes.⁷ Reports suggest that Sweden and Russia are also in talks with Hyperloop companies to assess the feasibility of the technology in their markets.^{8,9}

Sweden

The project of this generation

Plans are being developed to create a new high-speed rail network to link Sweden's three biggest cities: Stockholm, Gothenburg and Malmö/Copenhagen. The project will cut travel times by more than half and should help free up existing capacity for freight transportation.¹⁰ Building the network will require investment into new rail and rolling stock technology to allow the proposed maximum speeds of 320 kilometers per hour. It will not only be one of the fastest trains in the world, but it will also be the largest infrastructure project in over a generation for the Swedes. Having recently delivered the current 'fastest train in the world', China's contractors have expressed interest in helping to deliver this project.¹¹

UK

Crossing the River Thames

A new tunnel has been proposed by Transport for London (TfL) to link the existing Blackwall Tunnel approach in Greenwich to Royal Docks across the Thames to the North East. TfL held an 'industry day' where they discussed the project scope and procurement with interested contractors, investors and funders in May. The project is structured as a 25-30-year availability-based concession agreement, with a proposal to fund part of the project through the introduction of road tolling on the new tunnel as well as on the existing and adjacent Blackwall Tunnel.¹² Construction is set to start in late 2018 with operations scheduled for some time in 2022 or 2023.

New debt funding for Thames Tideway?

Having already invested around GBP1.27 billion of equity into the Thames Tideway project, the project owners are now understood to be considering raising an additional GBP900 million of debt to help finance the construction of the London mega-sewer.¹³ It is believed that the European Investment Bank will provide around GBP700 million of the debt, with the additional GBP200 million expected to be raised through an issuance of private placement notes. The project owners hope to achieve a rating of BBB+, similar to that of the project's existing debt, but may scuttle the plans if they are unable to find a sufficiently attractive price. Any debt raising move would likely happen ahead of the Brexit referendum in June.

Keeping London's economy growing

With the full support of the National Infrastructure Commission, the UK government lined up behind the proposed Crossrail 2 project designed to create a new North-South link across London. The project is expected to cost around GBP30 billion (in current prices) and will deliver much-needed new rail capacity and reduce overcrowding.¹⁴ In March, the UK Chancellor — George Osborne — allocated some GBP80 million towards developing the project and noted it as a priority area within the national budget.¹⁵ The National Infrastructure Commission would like to see a Hybrid Bill ready for parliament by 2019 in order to clear the way for the scheme to start operations by the early 2030s.

Ireland

Building on recovery

Ireland's government unveiled a massive 6-year capital investment framework supported by around EUR27 billion in government funds over a 5-year period. The program, launched under the banner of "Building on Recovery 2016–2021" envisions significant investments in transport, education, health and enterprise. The jewel in the crown will be a new rapid transit system for Dublin Airport which will cost some EUR2.7 billion, but will only

start construction in 2021. The government will also allocate around EUR3 billion to the Social Housing Strategy and almost EUR4 billion towards creating places for more than 19,000 new primary school students and a further 43,000 post-primary students by 2022.¹⁶

Asia

Kazakhstan

A road to improved public-private partnership (PPP)

Kazakhstan recently announced the winner of the Big Almaty Ring Road (BAKAD) project, awarding the contract to a consortium of Turkish and South Korean companies. Construction of the 66-kilometer toll ring road to bypass Almaty (Kazakhstan's largest city) is expected to cost around US\$680 million with a total concession period of 20 years. While the project has undergone numerous changes in the 7 years since it was first announced (including the inclusion of a compensation agreement on currency risk that exceeded 5 percent of the currency change),¹⁷ the project now represents the country's largest-ever PPP and the first in the highways sector. It is expected that the deal will catalyze the country's wider PPP market.

India

Lighting up the country

The world's largest integrated coal power project is now fully operational in Madhya Pradesh, India.¹⁸ The facility, which boasts installed capacity of some 3,960 megawatts, is fed by open cast coal mines producing around 16 million tons per annum. One of four so-called 'Ultra Mega Power Projects' planned by India's government, the project is owned by a subsidiary of Reliance Power (part of the Anil Dhirubhai Ambani Group) and is currently one of the lowest-cost power producers in the world. Interestingly, the contract was won through competitive bidding at an ultra-competitive levelized tariff of just INR1.19 per unit (less than 2 US cents) over the entire 25-year period of the off-take agreement.¹⁹

Source:

¹ <http://centreforaviation.com/analysis/lyon-and-nice-airport-privatisations-lessons-to-be-learned-from-the-events-at-toulouse-249583>

² <http://www.airline.ee/airports/chinese-buyers-bid-on-frankfurt-hahn-airport/>

³ <http://www.rail-baltica.com/pub/>

⁴ <http://www.railwaygazette.com/news/infrastructure/single-view/view/first-section-of-rail-baltica-inaugurated.html>

⁵ <http://www.baltic-course.com/eng/transport/?doc=117782>

⁶ <https://www.scribd.com/doc/303680507/Memorandum-Hyperloop-Transportation-Technologies>

Memorandum-Hyperloop-Transportation-Technologies

⁷ <http://www.dezeen.com/2016/03/11/hyperloop-to-connect-european-cities-bratislava-vienna-budapest/>

⁸ <http://fortune.com/2016/05/11/hyperloop-one-raises-80-million/>

⁹ <https://www.rt.com/business/343569-russian-railways-hyperloop-technology/>

¹⁰ <http://www.europeairwayreview.com/24901/past-issues/issue-5-2015-the-future-of-high-speed-rail-in-sweden/>

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¹³ <http://www.infra-news.com/news/funds-and-acquisitions/1771556/thames-tideway-planning-major-debt-raise.html>

¹⁴ <https://www.gov.uk/government/news/crossrail-2-will-keep-london-moving-we-should-get-on-with-it-right-away-adonis>

¹⁵ <http://www.standard.co.uk/news/transport/george-osborne-gives-green-light-to-crossrail-2-ahead-of-budget-a3203681.html>

¹⁶ www.per.gov.ie/en/capital-investment-plan-2016-2021

¹⁷ <http://www.worldhighways.com/sections/emergent/features/kazakhstan-london-road-show-woos-consortia-for-almaty-ring-road/>

¹⁸ http://articles.economicstimes.indiatimes.com/2015-03-30/news/60644178_1_sasan-umpp-moher-amlohri-renewable-energy-based-capacity

India's first high-speed rail gains momentum

The Government of India has inked a Memorandum of Understanding (MoU) with the Government of Japan to move forward the Mumbai-Ahmedabad High-Speed Rail Corridor. Japan has agreed to fund 81 percent of the project costs (estimated at around US\$15 billion) through a 50-year loan at an interest rate of just 0.1 percent.¹⁹ The MoU also includes a moratorium on repayments for the first 15 years. The 500 kilometer high-speed rail line (which includes a 21 kilometer tunnel) is expected to cut travel time in half and it is hoped that it will help take some pressure off Mumbai's hot housing market. Work is expected to start in 2018 and should be complete by 2025.²¹

Singapore

NEWater for Singapore

Singapore's 5th NEWater plant (widely known as Changi NEWater 2) is on track to achieve commercial operation by the end of 2016. The facility will add around 50 million imperial gallons per day to the island nation's water supply, helping the country achieve water self-sufficiency in the face of shrinking water supplies and growing populations. Structured as a 25-year design-build-own-operate PPP contract, the bid was won by a consortium of private sector developers and financiers comprised of Beijing Enterprise Water Group (marking a significant milestone for the Chinese developer, becoming the first foreign developer to participate in Singapore's water sector) and United Engineers Ltd. Public Utility Board (PUB) of Singapore is the off-taker and regulator for the project. The consortium is reported to have won on a first-year tariff of SGD0.275 (US\$0.20) per m³ and a total project cost of around SGD180 million (US\$130 million).²²

Waste not, want not

Southeast Asia's largest waste-to-energy project has successfully reached financial close in early May. The project finance lenders were DBS, Maybank, Mizuho and BTMU. Developed by Singapore's National Environment Agency (NEA), the project expects to augment the city-state's energy capacity and reduce waste at a rate of around 3,600 tons per day. The NEA, which acts as both the regulator and the recipient of the off-take, awarded the concession to an international consortium comprising of Hyflux and Mitsubishi Heavy Industries.²³ The project is expected to cost around SGD750 million (US\$542 million) and will deliver a reported first year cost of SGD55.19 (US\$39.95) per ton.

China

New funding for PPPs

Reports suggest that China's government is in the process of launching a new CNY180 billion (US\$28 billion) fund to help lower financing costs for PPP projects in the country. The fund is being launched with 10 financial institutions and it is believed that the first contribution payments were made in March 2016.³² Two of the shareholders — China Construction Bank and Postal Savings Bank of China — are to contribute CNY30 billion while other shareholders, including the Bank of China and China Life Insurance, will each contribute between CNY5 and CNY15 billion.³³ The management team will be based in the Ministry of Finance offices. This is further evidence of the growing PPP market in China.

Africa

Kenya

At the station ahead of schedule

Work is moving ahead quickly on the construction of East Africa's new Standard Gauge Railway project spanning Kenya, Uganda, Rwanda and South Sudan. The first leg from the Kenyan port of Mombasa to the capital of Nairobi is around 80 percent complete and is now expected to be finished in December, at least 6 months ahead of plan.²⁴ Kenya Railways Corporation has now started the search for a private operator to run the Mombasa to Nairobi line.

Americas

US

Stalled no longer

Frequently referred to as 'The Most Important Infrastructure Project' in North America, The New York/New Jersey Gateway mega-program seems to be moving forward. Originally proposed in 2011, the program picked up momentum recently when the Governors of the two states approached the federal government with a funding proposal aimed at helping to fast track the seemingly stalled program.²⁵ The program intends to deliver much-needed updates and capacity increases to the region's existing commuter rail infrastructure including updates to the 105-year-old Hudson River Tunnels and the

development of two new trans-Hudson River tunnels that will double capacity once completed and enable high-speed rail service along the Northeast Corridor.²⁶ The program is comprised of a series of projects with the total cost estimated at more than US\$20 billion and, once funded, will take around 15 years to complete.

US powers Africa

It seems that President Obama's 'Power Africa' initiative is making strong progress towards its goal of doubling access to electricity in Sub-Saharan Africa by 2030. The program has already committed an initial US\$7 billion and has helped mobilize more than US\$20 billion in private sector commitments to invest in power generation and distribution assets.²⁷ With an ambition to add some 30,000 megawatts of new generation capacity and more than 60 million connections to the grid, the initiative will now move towards selecting its panel of advisors with the intention of starting delivery of the new capacity shortly thereafter.²⁸ The program should impact more than 40 Sub-Saharan countries in Africa.

Canada

Canada's armed forces transforms management of its real property portfolio

Custodian of the country's largest and most complex portfolio of real assets, Canada's Department of National Defence is now exploring opportunities to promote greater use of new technologies and increased industry participation in the delivery and maintenance of their portfolio. The department manages more than 20,000 buildings, 12,000 military housing units, 16,000 works (such as sewers, pipelines and electrical circuits) and more than 2 million hectares of land.²⁹ The department is working to improve the delivery of real property projects in infrastructure design, new construction, repairs and renovations, demolition, maintenance and energy performance contracts.

A platform of infrastructure

Having been swept to power on a platform that centered on infrastructure renewal and development, Canada's Liberal Party is now developing plans to invest more than US\$100 billion into infrastructure over the next decade. The plan includes a dedicated US\$45 billion that will be shared equally between social, green and transit projects. The government is prioritizing 'shovel worthy' projects in an effort to invoke infrastructure morality principles that will help build a

more sustainable and successful economy for generations to come.

A golden age of transit

Nearly every major metropolis in Canada now boasts a major transit project coming to market in the next 5 years. Indeed, many of Canada's most ambitious and complex projects are being taken in the light rail transit and metro sectors. Montreal, Calgary, Vancouver and Toronto all plan to kick off projects with a combined total greater than US\$30 billion, while existing projects in Ottawa, Waterloo, Winnipeg, Edmonton and Vancouver (worth an estimated US\$15 billion) are expected to be completed between 2018 and 2022. Catalyzed by a new social and environmental focus, it is clear that Canada is now entering a golden age of urban transit.

Argentina

Turning a corner on default

Ending a 14-year legal battle with holdout creditors, Argentina turned the corner on its 2001 debt default. Following the payments, Fitch and Moody's (two of the biggest credit rating agencies) upgraded the country's debt to a B grade which, while still speculative, removes some of the substantial risks that lower ratings hold. The World Bank announced around US\$2 billion in new loans to the government. Latin America's development bank CAF also authorized around US\$2 billion in loans, mainly for infrastructure. The move has already helped recapture the attention of international capital markets and will undoubtedly pave the way for a new stage of growth and development.³⁰

Mexico

Mexico City's airport takes flight

Construction is to begin this year on Mexico City's new airport.³¹ The facility will be one of the three largest in the world and is designed to be a 100 percent sustainable project. The works will be financed mostly through public funds and public debt guaranteed by future cash flows while other periphery projects will be developed as PPP arrangements. The concession was directly granted to Grupo Aeroportuario de la Ciudad de Mexico, a state-owned company, with a 50-year concession from the start of operations. The airport will sit on more than 4,000 hectares of land and will boast an initial capacity of 50 million passengers per year. New facilities surrounding the current Mexico City International Airport will also require an estimated US\$7 billion in public investment.

Source:

¹⁹ http://www.business-standard.com/article/companies/reliance-power-gets-cerc-rap-may-lose-tariff-benefit-114080900777_1.html

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²⁵ http://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/Joint%20_Letter_To_President.pdf

²⁶ http://www.nj.com/traffic/index.ssf/2015/05/inside_the_aging_cracking_hudson_river_train_tunnels_that_would_cost_billions_to_replace.html

²⁷ <https://www.usaid.gov/powerafrica/newsroom>

²⁸ <https://www.usaid.gov/powerafrica/aboutus>

²⁹ Defence Real Property Strategy October 2013

³⁰ [http://www.buenosairesherald.com/article/213851/caf-grants-government-us\\$2billion-loan](http://www.buenosairesherald.com/article/213851/caf-grants-government-us$2billion-loan)

³¹ <http://mexiconewsdaily.com/news/advances-continue-on-mexico-city-airport/>

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³³ <http://www.out-law.com/en/articles/2016/march/china-launches-28-billion-ppp-fund/>

It's time to talk about morality

In one way or another, the issue of infrastructure 'morality' has been front page news for years. Whether it is shoddily-built bridges and corrupt procurement processes or forced displacements and poor labor conditions, it is clear that society is deeply concerned about the morality of infrastructure decisions. So why is nobody in the sector talking about the issue?

As an industry group, infrastructure players often boast about the benefits their assets and investments deliver to society. Yet when it comes to the morality of infrastructure decisions, we tend to shy away from talking about the issue. But this can no longer go on.

Infrastructure morality has now unmistakably moved to center stage. In part, the global debate about infrastructure morality has evolved in explosive bursts, catalyzed by an ongoing series of public failures and front-page news about corruption, malpractice and environmental degradation. But it is also being driven by an



increasing recognition — largely on the part of government — that infrastructure investments must benefit not only economies but also people, the planet and future prosperity.

One of the big challenges with the entire morality debate is that the ‘terms and conditions’ that underpin the moral contract between infrastructure and society continuously change. Fifty years ago, nobody had really considered the need for public consultations. A hundred years ago, we were busy knocking down villages to make way for industrial complexes.

Today, the rules are changing almost daily. Transparency has become the watchword of the decade. From regulators demanding greater transparency in pricing, environmental impact or risk

management through to public anti-corruption drives (and even Presidential impeachments), it is clear that policy makers and regulators are anxious to demonstrate and encourage greater transparency in infrastructure.

Through Twitter, Facebook and Tumblr — to name but a few social networks — society has also shown a clear desire to promote transparency. As Richard Boele notes in his article on page 26 (*The power of social license*), social media has become a powerful force for transparency in civil society. So, too, has the media who now increasingly view social media and its influencers as reliable sources.

The shift towards greater participation of the private sector in infrastructure seems, overall, to have improved transparency. Notwithstanding a handful

of high-profile scandals, the introduction of private sector practices such as rigorous due diligence, independent audit and transparent procurement processes has driven a new level of professionalism across the infrastructure sector.

We believe that the time has come for the infrastructure sector — governments, developers, investors, operators and suppliers — to tackle this debate head on. We must recognize the inexorable link between infrastructure and morality. We must articulate our commitment to moral practices and outcomes.

Most importantly — we must turn our words into action by challenging the morality of our decisions and continuously asking how we can do better. And we can do better. ■

Deny migration at your peril

The EU Refugee Crisis is a grim yet stark reminder of the unyielding and relentless force of migration. It also clearly illustrates the desperate need for a new approach to managing and integrating migrant flows.



Whether it is Syrians, Iraqis and Afghans arriving on the shores of Greece each day, migrant agricultural laborers in Africa and Asia, or even recent retirees looking for a more sedate lifestyle, the reality is that migration will never stop. Those that deny the impact this has on their infrastructure do so at their own peril.

Migration is not a new phenomenon. For millennia, populations have moved from place to place in search of a better life. Migration has created great cities (all cities are ultimately the result of migration from the countryside) and great nations (rightly or wrongly, the US, Canada and Australia were 'founded' by successive waves of migrants).

What made these cities and nations great, however, was not simply the addition of new workers and consumers. It was their ability to recognize the value of migration and then create the right environment to effectively and quickly integrate them into the existing society and the economy.

The US's Ellis Island is a perfect example. Recognizing that more than 1 million people would arrive on their shores each year, the US developed the massive Ellis Island facility. More than 12 million immigrants

passed through the immigration facilities between 1892 and 1954 before being dispersed across the country. Today, more than 100 million Americans trace their history back to Ellis Island.

Interestingly, it is the developed world that now seems to be struggling with the forces of migration. South Africa has put significant focus into facilitating the movement of migrant laborers to the mines and farms across the country. China — while challenged to accommodate the sheer number of migrants flowing into their cities in the past — has similarly started to focus on easing and facilitating the integration of migrants.

At the same time, the so-called 'mature' markets have taken a significant step back. Walls and fences are already being constructed across Europe; in the US, a proposal has been made to build a wall to stop the flow of migrants from Mexico and South America. And across the EU, governments are in turmoil — and increasingly in conflict with each other — over the current migrant crisis.

The perplexing thing is that — facing aging populations, relatively stagnant growth and shrinking tax revenues — one would think that the mature markets

would want to welcome migrants with open arms. Forward-thinking governments would view migrants as a new source of productivity and vibrancy and would take the right combination of steps to improve the management and integration of migrants into their economies and societies.

In the short term, this will require significant new infrastructure and a new 'lens' of prioritization. Processing centers, housing, transportation and social services will all be required, as will investment into skills, education and training. Making the right decisions and investments — while balancing against the needs of current citizens and residents — will not be easy, but it will certainly be necessary.

The alternative is no alternative at all: masses huddled in refugee camps for decades; an increase in lawlessness and crime; a loss of potential economic growth; and a full-scale humanitarian crisis playing out right on our doorsteps.

The sooner governments recognize the inevitability of migration and start taking steps to facilitate and manage it the better. Those who continue to deny the impact of migration do so at their own peril. ■



Rejecting the scourge of corruption



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As major corruption scandals continue to emerge around the world, it has become increasingly clear that society is starting to reject the scourge of corruption. The big question now is whether governments, infrastructure procurers and providers will seize this opportunity and public momentum to stamp out corruption in all its forms. Given the impact that corruption has on the infrastructure sector, it seems clear that there is no time to waste.

The cost of corruption

Corruption is still endemic around the world. Every year, hundreds of billions of dollars are syphoned away from important projects and investments, enriching a few at the expense of the majority. What is worse is that — in many markets — perpetrators are allowed to operate with virtual impunity.

The impact of corruption is massive; it is not just about a 'dash' here or a 'tip' there. According to the EU Commissioner for Home Affairs, about EUR120 billion is lost to corruption each year across the 27 EU member states alone. In the developing world, the damage is even more dramatic: some estimates suggest that around US\$1.26 trillion is stolen from the developing markets each year.¹

Now consider this, the World Bank estimates that the cost of redressing Africa's entire infrastructure deficit would be around US\$75 billion per year — that's less than two thirds of what is 'lost' each year in the EU and a tiny fraction of the money lost to corruption every year in the developing world. Very simply put, the best way to close the world's infrastructure gap is to stop corruption.

Corruption is everybody's problem

Let us be clear, corruption is damaging for everyone involved in infrastructure. For project owners, corruption leads to wasted costs, reduced margins and — increasingly — the risk of civil and criminal liability. Project funders and investors risk not only the loss of their investment (there are some cases of foreign investors arriving to open up a new project only to find that the asset was never built and the funds had absconded), but also reputational damage.

Recent events in Brazil have clearly demonstrated the risks raised by corruption for construction and engineering companies in particular (our interview with Artur Coutinho, CEO of Construtora Camargo Corrêa on page 14 illustrates some of the challenges facing that country's construction industry following the Operation Car Wash corruption scandal). SNC Lavalin's current experience in Canada suggests that companies participating in corruption overseas also risk losing out on lucrative contracts at home if found guilty.²

For the public at large, corruption in the infrastructure sector has massive implications for daily life, safety and productivity. Corruption takes capital out of the public system leading to fewer assets being developed. It syphons resources from project sites leading to dangerous and unsafe infrastructure. In some markets, it allows for disruptive

displacement of populations, creates the potential for damage to the environment and fuels criminal activity.³

The biggest burden falls on the narrowest shoulders

The particularly galling part of corruption in the infrastructure sector is that it tends to have the most significant impact on those who can least afford it. The worst offenders in Transparency International's Corruption Perception Index are also the countries with the poorest populations and most fragile economies — places like Somalia, Afghanistan and North Korea where the average worker makes less than a dollar a day.⁴

Estimates suggests that somewhere between 10 to 30 percent of the value of publicly-funded construction projects are lost to corruption around the world.⁵ At the higher end of that spectrum, someone is practically stealing one out of every three hospitals planned. It means that any country with a development vision for 2030 will need to wait until 2035 to achieve their goals. And it means that users may need to pay 30 percent more for their services than they should.

The impact on overall national productivity and economic growth is just as significant. According to one estimate, each dollar of road investment stolen in Indonesia reduces the economic benefit of that road by US\$3.41.⁶ In an era where governments are investing heavily into economic infrastructure in a bid to drive exponential growth in Gross Domestic Product (GDP) even small amounts of corruption can be crippling.

The anticorruption movement picks up steam

The good news is that the public discourse on corruption is clearly shifting and gaining voice — notably bolstered by social media. In key markets such as Brazil, China and India, governments have made anticorruption a key priority. And — based on Operation Car Wash in Brazil or even FIFA — it is clear that nobody is immune from persecution. Allegations and charges of corruption are front-page news and the message is getting out.

The recent Anticorruption Summit held by Transparency International in London in May indicated that governments, companies and civil society are starting to demand more action to meet the challenges posed by corruption. The resulting Anticorruption Manifesto provided some clear proposals and the commitments made by governments were encouraging.

Interestingly, the growing drive to bring private sector investment into infrastructure

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Estimates suggests that somewhere between 10 to 30 percent of the value of publicly funded construction projects are lost to corruption around the world.”

seems to also be having a positive impact in the fight against corruption. Yes — there are certainly examples of companies and individuals that have used their influence or their capital for corporate advantage or personal gain. But, more often, the need to attract and retain private sector investors has led to greater transparency, more robust project due diligence and greater oversight.

Time to act

Over the next 10 to 15 years — the public discourse on corruption will evolve in much the same way as the recent debate about tax. Just a decade ago, most companies believed it was 'acceptable' to avoid tax wherever possible. But today, perceived tax avoiders or (worse) tax evaders are actively being hunted down by not only tax authorities but also the media. Over the next decade, those involved in corruption will also be ferreted out and brought to public justice.

Clearly, there are tremendous incentives to stamping out corruption. And we believe that governments should be redoubling their efforts to remove any opportunity for corruption in the infrastructure sector across the project life cycle, from procurement and financing through to operations and management. Companies and investors should also be sharpening their focus on spotting potential signs of corruption and be willing to walk away from projects in order to protect their investments and reputations.

Brazil's current scandal may be highly disruptive to the economy and hugely damaging to those individuals and companies implicated, but it also makes it clear that there is a limit to how much corruption will be tolerated by a population. And all signs indicate that Brazil's anticorruption fervor is likely to spread across other markets. In the long run, this should be good news for everyone involved in infrastructure and those who use it. ■

1 <http://www.transparency.org.uk/corruption/corruption-statistics/>

2 <http://www.theglobeandmail.com/report-on-business/snc-lavalin-calls-on-feds-to-adopt-corruption-settlement-deals/article27188907/>

3 http://www.giacentre.org/cost_of_corruption.php

4 <http://www.transparency.org/cpi2015#results-table>

5 <http://www.engineersagainstopoverty.org/documentdownload.axd?documentresourceid=4>

6 <http://web.worldbank.org/archive/website01021/WEB/IMAGES/WPS4099.PDF>

Investing in secure futures for the world's poor: Delivering on the UN's Sustainable Development Goals

With the UN's Sustainable Development Goals (SDGs) less than a year old, many infrastructure players are still trying to figure out what role they should be playing in the achievement of these massive global objectives. To learn more about the SDGs, *Insight* magazine sat down with **Amir Dossal, Founder and Chairman of the Global Partnerships Forum and former UN Chief Liaison for Partnerships**, and **Lord Michael Hastings, KPMG's Global Head of Corporate Citizenship**.

“Everything that I have seen through my work with the UN and the Global Partnerships Forum tells me that — if we put our minds, our capital and our resources towards it — we can make a difference.”



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Editor (ED): How are the SDGs different from the Millennium Development Goals (MDGs)? What has changed since the MDGs were set in 2000?

Amir Dossal (AD): The MDGs were a first step towards bringing the international community together to coalesce around a set of global targets. They really set the stage upon which UN member states and multilateral institutions could collaborate. But it was also clear that the MDGs did not cover everything and there were a number of areas that stakeholders felt should be included in the goals in order to create a more harmonious and peaceful society.

One of the big differences between the MDGs and the SDGs, however, is in the inclusive approach that the UN took to set the goals. I think there is a broader sense of ownership over the SDG goals that couldn't be established with the MDGs.

Lord Hastings (LMH): The ownership of the SDGs is vitally important. The MDGs often came as governmental targets and were largely supported by governmental money. The SDG targets, on the other hand, are set between business, governments, civil society and other public institutions and make everyone responsible for creating solutions.

The SDG goals and targets are also much more aspirational than those that came before. We used to talk about cutting extreme poverty in half. Now we are talking about eradicating extreme poverty entirely.

ED: With such massive goals, can the SDGs ever really be achieved?

LMH: The SDGs certainly reflect a wave of optimism. And nobody would be naïve enough to suggest that there will never be poverty. But if you think about the impact of well-planned and sustainable infrastructure and its ability to improve productivity and jobs — and then all of the opportunities that go with those jobs — it is not difficult to envision a world in 2030 that is better educated, more sustainable, fairer, healthier and more productive. Is that possible? I believe it is.

AD: Lord Hastings is absolutely right. The SDGs are a completely new deal. They are aspirational targets and goals, set through an inclusive process. Everything that I have seen through my work with the UN and the Global Partnerships Forum tells me that — if we put our minds, our capital and our resources towards it — we can make a difference.

ED: Has the private sector stepped up to the challenge?

LMH: There are many examples of private sector organizations creating programs that respond to the SDGs. At the World Economic Forum in Davos in January, for example, the CEOs of Tesco, Unilever, Nestle, Royal DSM, the Rockefeller Foundation — and almost two dozen other companies — came together to launch Champions 12.3, a group of mostly private sector organizations focused on responding to the SDG 12.3, which calls



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KPMG professionals could write checks and volunteer all day but we wouldn't have the same impact we do when we help organizations come up with new innovative approaches and ideas that cut to the core of the SDG challenges. ”

Lord Michael Hastings

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for a halving of food waste by 2030. These are organizations that recognize the value — both in global terms and in financial terms — of doing what is right.

AD: I would say the response from the private sector has been tremendous. The UN has a website where they ask people to contribute and showcase projects and there are nearly 2,000 different projects on the site related to the SDGs. Personally, I think the most exciting ones are where local people create local solutions that improve capacity and drive growth. Entrepreneurs and business leaders — like Aliko Dangote in Nigeria who is helping to build that country's first working oil refinery which, in turn, will enable more of the resource wealth to be transferred back to Nigerians — are demonstrating the value of helping people to become more self-sufficient.

ED: Is this about expanding the corporate social responsibility budget?

AD: I'm certainly a big believer in traditional corporate social responsibility. But this isn't about hand-outs and aid. This is about the private sector using their core strengths — whatever is in the DNA of their organization — to create good in society. Nobody is asking institutional investors, for example, to donate infrastructure to Africa out of the goodness of their hearts. What we are asking is for them to use their experience, capabilities and skills to improve the flow of investment

funds to projects that deliver capital returns and help achieve our SDG goals.

LMH: Using your core capabilities and skills to drive positive change is critical. KPMG professionals could write checks and volunteer all day, but we wouldn't have the same impact we do when we help organizations come up with new innovative approaches and ideas that cut to the core of the SDG challenges. More sustainable cement production, road surfaces that recapture energy, renewable energy systems; if we can help bring these ideas and solutions to market, we can make a much bigger difference than simply writing a check could ever accomplish.

ED: Is there still a role for traditional aid and international aid agencies?

LMH: Nobody is saying that there isn't still an important role for aid. But when it comes to massive problems the scale of which the SDGs are trying to solve, aid is an old solution. What we are talking about today is encouraging the market to deliver the best possible solutions and deploy capital in ways that help create jobs, reduce poverty and drive sustainability.

AD: I think the SDGs have also inspired the traditional aid organizations to step up their focus on partnerships with the private sector. The UK's Department for International Development has been at the forefront of leveraging their aid assistance to create jobs and economic sustainability. And the Organization for Economic Co-operation and Development recently refined its view on so-called 'ODA' (Official Development Assistance) to encourage donors to work more closely with the private sector. As Lord Hastings noted, aid is an old solution. And now we need new solutions to old problems.

ED: What role can infrastructure play in delivering on the SDGs?

LMH: To say that infrastructure providers are fundamental to the achievement of

these sustainable development goals is an understatement. So many of the problems we face today can be solved with better physical infrastructure and better communications infrastructure. We need to build schools and hospitals — but we can build fewer physical assets if people have access to online learning and tele-health services.

AD: Much like other private sector organizations, I believe that infrastructure players need to think carefully about how they can use their core strengths to move the needle on some of these goals. In some cases, it could be partnering with an agricultural development agency to provide logistics advice and supply chain insights. Or it could be choosing to use lower-carbon materials to create a more sustainable asset footprint for a new development. Each company needs to think about what they can contribute to the achievement of the SDGs.

ED: What can infrastructure players do differently to help achieve the SDGs?

AD: I think it's quite clear to everyone that we cannot continue on with business as usual. What we need is to start taking some risks. We need to be trying different platforms and innovating in our approach. Simply put, we need to be moving the needle from talk to action. We know the problems; we know the solutions; now all we need to do is act.

LMH: At their core, the true purpose of the SDGs is not to eliminate hunger or reduce poverty, it is to bring dignity to those who have often been outside of the conversation of opportunity. I think that — for infrastructure players — the aim should be to create infrastructure for the dignity of those who use it.

Learn more at kpmg.com/globalgoals ■

Brazil's construction companies emerge from the Car Wash



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Mauricio Endo (ME): What impact has the Operation Car Wash scandal had on Brazil's construction industry?

Artur Coutinho (AC): Clearly, there has already been a far-reaching impact on companies across Brazil, but most notably in the engineering and construction industry. This, tied to the restricted financial scenario currently at play in Brazil, is making the recovery process very difficult for many companies. And investigations are still pending so I suspect the sector still has a long road ahead in terms of repercussions and new developments.

ME: There has been significant backlash from Brazilians and from investors.

As Brazil's Operation Car Wash (Lava Jato) continues to widen and the political fallout grows, investors and infrastructure participants around the world are watching to see what impact the scandal will have on the country's construction sector and its prospects for growth. To find out how Brazil's construction companies are responding — and recovering — from the scandal, **Mauricio Endo, KPMG in Brazil**, sat down with **Artur Coutinho, CEO of Construtora Camargo Corrêa**, one of Brazil's largest international construction companies.

Are you surprised by the negative sentiment?

AC: Not at all. We all know that fair competition brings and assures better quality products and services, improves productivity and creates more capable professionals. And Brazilians want to be served by a modern, efficient and low-cost infrastructure industry. I firmly believe that only an ethical, fair and sustainable business environment can bring benefits to the economy and society.

ME: How has Construtora Camargo Corrêa responded to the scandal?

AC: I am proud to say that we were a pioneer among Brazil's major construction companies and we worked hard to wipe the slate clean

and exit the Car Wash operation by adopting a responsible posture of collaborating with investigators and working to create a business environment that is grounded in ethics, technical competence and transparency.

ME: What does that mean in practice for your company?

AC: A lot of our efforts are focused on ensuring that our company culture, policies and procedures are aligned with Brazil's new Anticorruption Laws which were recently updated to bring them in line with the best in the world including the US and the UK. By combining a keen focus on professional training with a dedication to creating an ethical and responsible culture — for us



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We clearly have a long road still ahead. But if we want to create an ethical, fair and sustainable business environment, corporate compliance programs are not enough.”



Artur Coutinho
CEO, Construtora Camargo Corrêa

and our suppliers and partners — we believe that we are emerging from the scandal stronger and more prepared to compete in a fair and transparent manner than ever before.

ME: Has transparency been elevated as a result?

AC: For many years, Construtora Camargo Corrêa has maintained a strong audit and internal controls capability. But in June 2015, we created a new Vice President position for corporate governance and compliance which includes audit and risk management. The elevated role has helped us to strengthen many programs, particularly professional training. On top of in-class training, we have also rolled out e-learning tools to ensure we reach 100 percent of our employees. We have been very clear that those old practices are irregular and counter to our Code of Conduct and we take a zero tolerance position on this type of wrongdoing.

ME: What has Brazil's government and industry sector done to improve transparency in infrastructure procurement since the scandal?

AC: I think the implementation of modern Anticorruption Laws that are comparable to the US and UK was a major move towards enhancing the business environment in

Brazil. And at the industry level, we have been participating in programs to expand sector awareness and adherence to a rigorous ethical and conduct code. But ultimately, the relationship between the public and private sector needs to be fundamentally redefined and corruption needs to be combated permanently. That is the only way we will facilitate long-term planning and efficiency in our investments while also providing greater transparency and predictability.

ME: Do you think the hard lessons have been learned?

AC: Very high-profile executives and companies are paying a very high price for the bad practices they adopted in the past and I am sure they will never want to pay that high a price again. I think that — with other public and private entities now adopting the same high level of transparency and collaboration — we can build a market based on ethics and technical competence which will surely have a long-term positive impact.

ME: Will Brazil's construction industry rebound from this scandal?

AC: The fact remains that Brazilian competence in engineering and construction is well proven in all areas of construction. Our company has been in business for more

than 75 years and operates in 20 countries around the world, so we have an impressive legacy of large projects across energy generation, roads, subways, ports and airports. We firmly believe that — as the business environment changes — we will emerge much stronger.

ME: Will the scandal impact the way Brazil invests into infrastructure over the longer-term?

AC: We recognize that there is an enormous and historic need for infrastructure in all areas of the country. But when the government resumes investment, they will need to ensure that infrastructure projects are contracted in a way that guarantees regulatory stability, long-term planning and efficient investment.

ME: What will it take to turn the corner on Operation Car Wash?

AC: We clearly have a long road still ahead. But if we want to create an ethical, fair and sustainable business environment, corporate compliance programs are not enough. We will also need a drastic reformulation of the way construction and engineering projects are contracted. We strongly believe in Brazil and are confident that the country — and its construction companies — will move past this issue, stronger and more competitive than before. ■

Catalyzing development: Bangladesh's PPP Authority

By James Stewart

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Bangladesh hopes to transform into a middle-income country by 2021. And it expects infrastructure to help drive that transformation. At the center of Bangladesh's efforts to attract infrastructure investment is the country's public-private partnership (PPP) Authority led by Syed Uddin. While the unit faces massive challenges, it has also made significant progress.

It is no wonder that Bangladesh is known as one of the 'Next Eleven' emerging markets. The country boasts South Asia's third largest economy and has enjoyed steady economic growth of more than 6 percent since 2011. Bangladesh's textile industry is booming, representing more than US\$25 billion in exports in 2014. And the country is rich in natural gas, coal and hydro-electric potential.

Yet, Bangladesh ranks a mere 144th on the Human Development Index. Gross Domestic Product (GDP) per capita, while up more than 60 percent since 2009, still ranks below that of Myanmar and Yemen. And around a third of the population still lives below the official poverty line of US\$2 per day.

According to Syed Afsor H. Uddin, Chief Executive Officer of Bangladesh's PPP Authority, the government knew it would need to further build on the already good economic growth if it hoped to impact poverty rates and transform the country into a middle-income economy. "Growth had been good up to 2009, averaging over 5.5 percent the previous decade, but we knew it had to be higher if we wanted to really impact development and there was broad consensus that the only way to achieve that growth was through investment into infrastructure," noted Mr. Uddin.

A champion for PPP

With the 6th Five Year Plan (2011–2015) for national development setting a goal of tripling PPP infrastructure investment as a proportion of GDP (increasing from an initial 2 percent to 6 percent) by the end of the Plan period, Bangladesh's government recognized that new sources of funding would need to be found. "For infrastructure development we started by sourcing financing from the

various development banks and they remain a key partner in addressing our infrastructure constraints, but it was clear that we needed to attract much more investment if we wanted to achieve our goals," noted Mr. Uddin.

In response, the government established what was then known as the PPP Office. "At the time, there was no centralized body in Bangladesh to champion the PPP program," added Mr. Uddin. "We needed an entity that could act as champion, facilitator and regulator by working across both the public and private sectors."

Bangladesh had some experience with PPPs in the past. A handful had been launched in the late 1990s and, more recently, the country had seen some success with PPPs in the energy sector. However, the national government recognized that a more formal and transparent program meeting international best practices and norms would need to be in place if the country was to attract the scale of national and international investment required to meet the infrastructure gap.

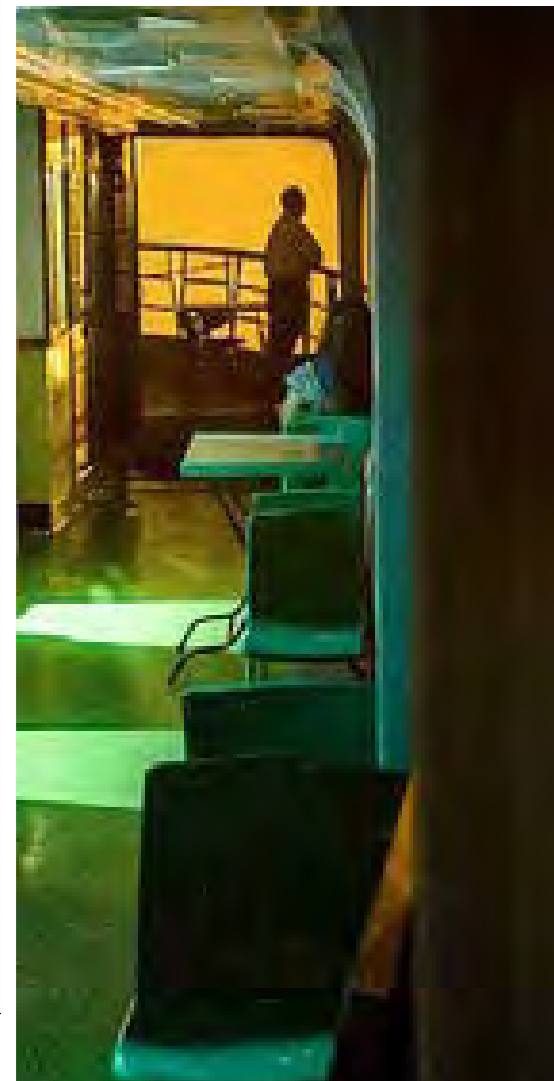
Providing leadership

Joining the team as the CEO in 2012, Mr. Uddin was encouraged to start fresh. "When the government set up the PPP Office, they left open the strategy for implementation," he pointed out. "What they wanted was someone who could come in, define the holistic program for the next decade and then drive the program to success."

Leadership would be key and Bangladesh's government was keen to provide the new CEO with the scope to catalyze real change. The PPP Authority was established as an independent body reporting directly to the Prime Minister and supported by a board of governors that

includes the Finance Minister and the Principal Secretary to the Prime Minister.

Mr. Uddin has also been invested with significant leeway to catalyze change. "Very often, it really comes down to the leadership of the individual unit," noted Mr. Uddin.



“When we see a problem or challenge, it is really up to me and my team to come up with recommendations and strategies which are then presented to the Honorable Prime Minister, Finance Minister and others for endorsement.”

Balancing economic and social objectives

Bangladesh's PPP Authority works across government departments to help bring alignment between economic, social and development goals. The strategic vision for the country is established through successive Five Year Plans (Bangladesh's 7th Five-Year Plan was announced in December 2015) which outlines the development and social goals of the nation. Government departments are then tasked with creating programs to help achieve those social and development goals.

“There is certainly a national framework on the basis of which government allocations are divided between the departments in order to help achieve these goals,” explained Mr. Uddin. “But there is flexibility for some investment priorities to take into account current issues that are seen as particularly important to the sitting government or society as a whole.”

Interestingly, Mr. Uddin points to the fact that economic infrastructure forms the bulk of the PPP pipeline as proof that government is taking a more ‘hands-on’ approach to achieving

social objectives. “For the most part, social projects, where commercial viability may be more difficult, are being delivered through public finances, which gives the government more control over affordability and ensuring access for all.”

Taking a measured approach

In 2015, Bangladesh passed its first PPP law. Mr. Uddin argues that — while the law could have been passed much sooner — the PPP Authority wanted to take appropriate time to ensure that the law would not only provide a legal framework for PPPs, but that it would also be flexible and workable across a variety of sectors and scenarios.

“The big danger of rushing to create a PPP law is that you may suddenly find that — in practice — it is actually unworkable and there have been examples of markets that have had to go back to the drawing board and rewrite their legislation which can take years,” he added. “We wanted to take the time to really test our approach on projects to find where we could adjust and improve before we went to legislation.” In line with this approach, the Bangladesh government first introduced the Policy and Strategy for PPP projects in August 2010, prior to enacting the PPP law in September 2015.

Mr. Uddin believes that this rigor and focus has allowed PPP projects to be developed and delivered to a higher standard. “When

you are trying to attract private investment to a project, you really need to be very sophisticated in the way you plan and develop your project because of the different requirements you have around borrowing money,” added Mr. Uddin.

Unique realities, common lessons

Standing up a new PPP unit in a country like Bangladesh comes with some unique challenges and opportunities. But there are also a number of lessons that can be shared from Bangladesh's experience. The first is that each market is different and therefore requires a tailored approach to PPP. “You can't just take another country's experience and apply it to your own situation; you can take ideas and lessons but you need to recognize the difference — often subtle ones — that make each market unique.”

Mr. Uddin also notes the value of leveraging international experience and trusted advisors to help improve confidence in the process. “You need to think about what type of investor base you are trying to attract and then work to build capability and credibility in those areas,” he added. “We wanted to attract large international investors so we knew we would need to work with large international advisors that could lend another level of credibility to the program.”

Finally, Mr. Uddin advises the need for long-term commitment to PPPs and patience. “The reality is that PPPs take time” It can easily take between 5 to 10 years to go from concept to operations, having navigated through feasibility, procurement, negotiation, approval, financial close and construction and during that period there can be major changes in strategy, personnel and policy. “With typical election cycles of around 4–6 years in most countries, this is a challenge faced by both emerging and developed countries. It is in this context that the PPP units can play a critical role in guiding their government towards selection of projects that deliver socio-economic value for the country over the longer term.”

A strong pipeline and bright future

Bangladesh's PPP Authority has made significant progress. When Mr. Uddin joined the PPP Authority in 2012, the group had just three PPP projects in the pipeline. Today, there are 44 projects across seven major sectors worth an estimated US\$14 billion including a US\$3 billion expressway project, a new 220-kilometer transport corridor linking the capital Dhaka to the main port.

Obviously, only time will tell if Bangladesh's PPP framework and approach will have a significant impact on infrastructure investment and the achievement of social objectives. What is clear is that Mr. Uddin and his team are single-mindedly focused on removing any barriers to investment. We expect private investors to start to take notice. ■

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We wanted to take the time to really test our approach on projects to find where we could adjust and improve before we went to legislation.”

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Syed Afsor H. Uddin
CEO, Bangladesh's PPP Authority

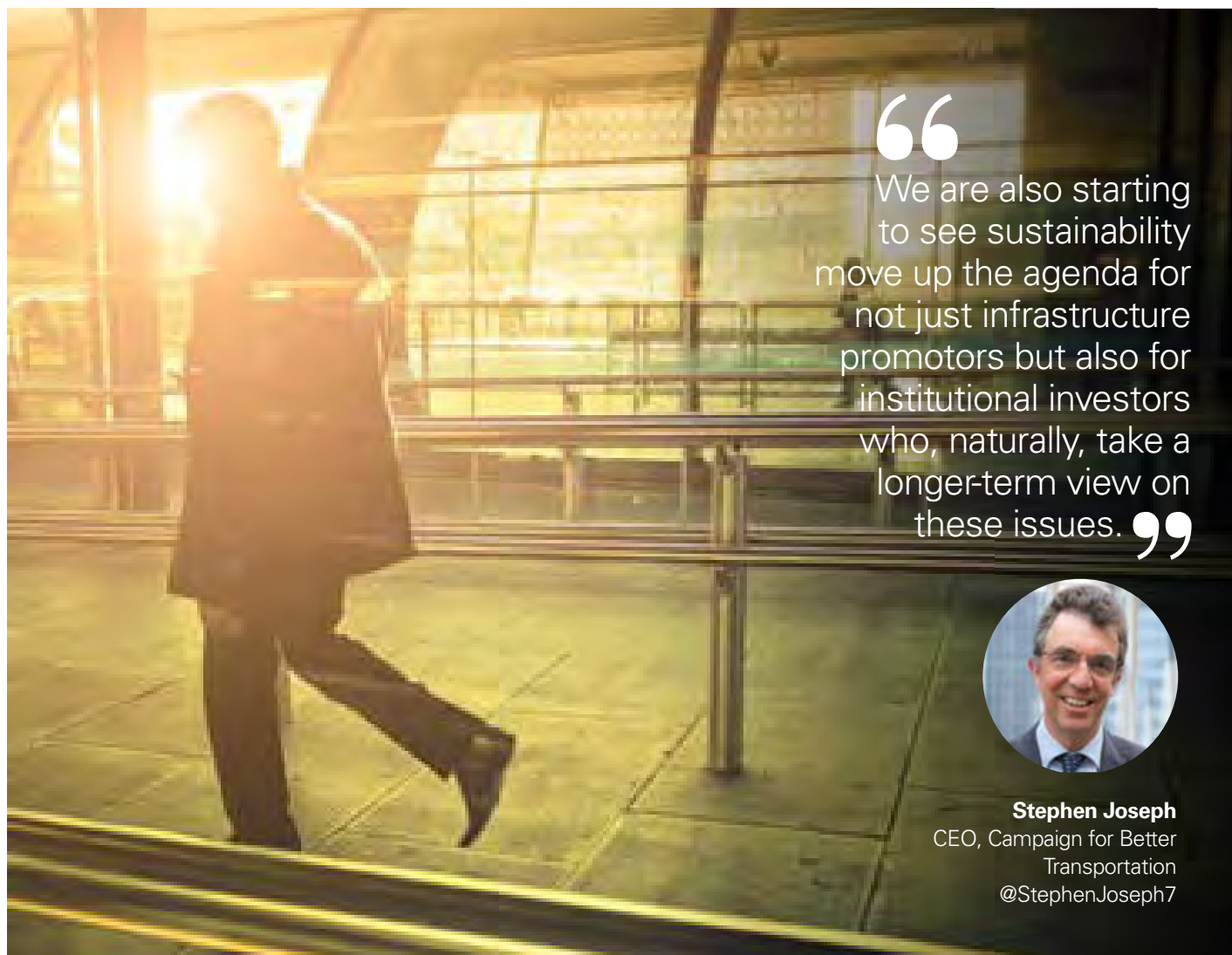


Looking for a more sustainable approach to transportation



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As focus on sustainable infrastructure rises, governments and developers are coming under increasing pressure to create more affordable transportation solutions that improve quality of life and protect the environment. In the UK, the Campaign for Better Transportation is one of the organizations campaigning for change in the way transportation is conceived and delivered. Recently, KPMG's **Richard Threlfall, Global Head of Public Transport**, sat down with the **CEO of the Campaign for Better Transportation, Stephen Joseph OBE**, to talk about sustainability, infrastructure and the public interest.



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We are also starting to see sustainability move up the agenda for not just infrastructure promoters but also for institutional investors who, naturally, take a longer-term view on these issues.”



Stephen Joseph
CEO, Campaign for Better Transportation
@StephenJoseph7

Richard Threlfall (RT): *We talk a lot about the sustainability of infrastructure, but sustainability can mean different things to different people. What does it mean for the Campaign for Better Transport?*

Stephen Joseph (SJ): I think there is consensus now that development needs to be sustainable not only in the environmental sense, but also in a much broader way: that it contributes to the needs of the population without compromising the interests of future generations. So that means not only respecting environmental limits, but more generally that it enhances lives for people and contributes broadly to the economy.

RT: *Are we starting to see more focus on sustainable infrastructure in the wake of the Paris Climate Change Agreement and the creation of the Sustainable Development Goals by the UN?*

SJ: The Paris Agreement marks the first time the infrastructure sector has had a real framework to consider in relation to achieving climate change targets. Multilateral efforts that set realistic expectations and goals are always helpful. Similarly, on a national level, we've seen the UK Supreme Court rule that the country was not doing enough to meet European Air Quality objectives, which has influenced a number of infrastructure investment decisions in the UK.

RT: *Issues related to the environment, sustainability, air quality and transportation were certainly front and center in the recent election for the Mayor of the City of London. Has that type of political focus helped improve the appetite for sustainable infrastructure?*

SJ: Certainly having candidates compete with each other to be more 'green' and more environmentally-focused gives a sense of where the public debate is now going. And I believe that politicians need to provide the type of leadership that is needed on these topics. But they need to provide leadership in terms of the types of outcomes they hope to achieve rather than handing over a pet project.

RT: *Are you seeing your efforts translate into different approaches to infrastructure investment?*

SJ: I think what we are seeing is greater emphasis being placed on understanding what infrastructure investments are trying to achieve. And what that translates into are questions about the types of demand we are experiencing and how we can meet that demand at a broader level. So it might be pricing strategies in the case of transport or creating packages of smaller measures rather than big projects to meet certain objectives. The point is that we are starting to think about options for meeting demand rather than simply saying "we need to build a new road" and then building a business case around it.

RT: *Have developers, investors and promoters started to include sustainability considerations into their plans?*

SJ: There are certainly some good examples of organizations that are making strong efforts. And we are starting to see infrastructure promoters push government to make sustainability more central to infrastructure development. We are also starting to see sustainability move up the agenda for not just infrastructure promoters but also for institutional investors who, naturally, take a longer-term view on these issues.

RT: *I think there are many in the industry that worry that individuals and communities will always lean towards 'NIMBY-ism,' even when it is clear that the broader 'good' — either geographically or across generations — outweighs the short-term or localized disruption. Are these concerns valid?*

SJ: Actually, we have found that when faced with the right kind of process, people do engage seriously and often come up with some good answers. But if they feel that the consultation process is being 'led' to a certain conclusion, you very quickly lose engagement or — worse — turn people against the project.

RT: *Infrastructure players are fairly good at assessing financial costs and economic benefits but I think they are less confident measuring things such as the concept of 'no net loss' to biodiversity. How can infrastructure owners take a broader view of the value of their investments?*

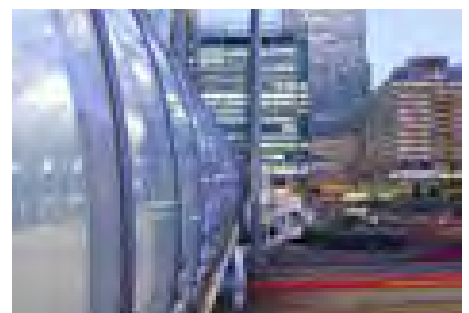
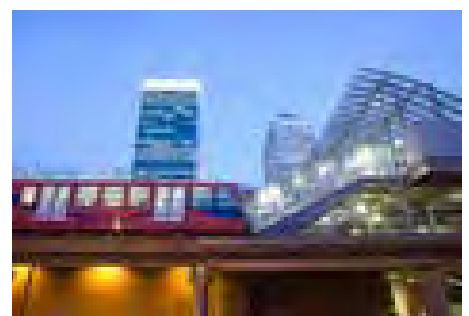
SJ: I think it all depends on the objectives you have set. It is certainly possible to measure biodiversity; the problem is that people don't usually do the right benchmarking right up front which causes problems with measurement later on. If you look at the Scottish Government's decision to re-open the Borders Line, that was not based purely on monetary returns but rather on a broader basket of objectives that the government had for that region. It's that combination of objectives aimed at improving the quality of life that are really important.

RT: *Has the devolution of power in the UK to local and national governments helped drive the sustainably agenda?*

SJ: Bringing the decision making about transportation closer to home is certainly creating a stronger debate about the sustainability of infrastructure. Mayors are starting to talk seriously about air pollution and that is taking them in different directions than may have been the case had investment decisions been made centrally. At the end of the day, the breathability of air is a local issue so having responsibility for infrastructure more devolved could certainly deliver some benefits.

RT: *From where we are today, do you ever see a point when your work will be done?*

SJ: Look, we've come a long way from the 1980s when people lay in front of bulldozers at Twyford Downs to stop new roads being



developed. Public consultation is much more common and I think the boundaries of the discussion shift back and forth and there are wins and losses. But I firmly believe that — in time — sustainability will be more and more at the heart of infrastructure and will become more mainstream for governments and regulators.

RT: *What advice would you give governments, promoters and developers as they start to incorporate sustainability considerations into their decision-making?*

SJ: The key is to engage early on at the strategic level to understand the broad base of options available to achieve your goals. And that means moving from a narrow 'project based' approach to one that instead looks at the portfolio of objectives and options. Ultimately, sustainable infrastructure is not going to be just something that is nice to have, it's going to be central to the way we live. ■

Positive returns and positive change in Africa



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As institutional investors start to look for better returns in emerging markets and developers look for new growth opportunities overseas, many have set their sights on Africa. With steadily growing economies, strong demographic trends and rising stability and security, infrastructure players are increasingly betting on the continent's growth potential.

In an exclusive interview for *Insight Magazine*, **Kate Maloney, a Director in KPMG's International Development Practice**, sat down with **Angela Nalikka, Manager of the Private Sector Infrastructure & PPPs at the African Development Bank (AfDB)**, to discuss investment opportunities on the continent and to find out how infrastructure players can help create positive change — and strong returns — by investing in Africa.

Kate Maloney (KM): Investors and infrastructure players are very interested in Africa. What is drawing people to Africa right now?

Angela Nalikka (AN): African infrastructure is good business and a really good investment, particularly since returns on infrastructure investments have largely peaked in Europe and the US. Smart international investors recognize that the early bird catches the worm and that — eventually — competition for good deals in Africa will get tighter and returns will fall as a result. People want to invest while Africa is still a competitive advantage.

KM: Are there particular sectors that capture the most attention?

AN: The AfDB, led by President Akinwumi Adesina, is strategically focused on five priorities dubbed the 'High 5s'. The first is to light up and power Africa; the second is to feed Africa; the third is to industrialize Africa; the fourth is to integrate Africa; and the final one is improving the quality of life for the people of Africa. What we recognize is that — across

all of the High 5s — energy is the catalyst. So we have a number of programs aimed at improving access to energy. Our goal is to help the continent achieve universal access to energy by 2025.

KM: How does the AfDB prioritize projects for investment?

AN: The process is fundamentally driven by the countries themselves through National Development Plans. These include sectoral focusses. For instance, in the energy sector, the focus ranges from increase in energy supply, investments in transmission networks through grid expansion, or increase in energy access. The AfDB will then help advise on the best way to attain this and also fund either through the public sector or private sector.

KM: Are most African governments open to private investment?

AN: Certainly one of the key things we look for before we engage the private sector is whether the regulatory and business environment is conducive to investment. I think all governments recognize the need for

private investment. The need is so great but there is no way that they have the budget to meet the demands and expectations of the population. I think governments recognize that for this to happen, they need to play their part.

KM: Africa has come a long way in terms of security but there are still a number of post-conflict zones where, arguably, the need for infrastructure is often dire. Are there opportunities to engage in these markets?

AN: At the outset, many post-conflict countries really need good advice and tools to help them understand how they can engage with the private sector in a meaningful way. Sometimes it's just not possible for the private sector to intervene right away but over time, we work to find projects that attract private sector investors. Just because there are challenges does not mean there are not opportunities. We worked with a private investor to make a meaningful investment into Sierra Leone's power sector right in the



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International investors increasingly recognize that African infrastructure is a really good asset class and I think we will see more activity as investors become more comfortable with doing business on the continent.”

Angela Nalikka

Manager of the Private Sector
Infrastructure & PPPs, AfDB
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middle of the Ebola crisis. They could see that the fundamentals of the economy were strong and were confident it was a market they wanted to put some capital into.

KM: Infrastructure investors are not only looking for good financial returns, they are also increasingly looking to do good for society and the environment at the same time. How do investments in African infrastructure improve the lives of Africans?

AN: Infrastructure certainly has a very big impact on the development of any country. Lack of it is considered a key bottleneck to development — lack of roads separates farmers from their markets; there will be no meaningful industrialization without reliable cheap electricity; and the list goes on. For instance, women often bear the brunt of the lack of power. The majority of our efforts on climate change are a direct result of deforestation and it is often women cutting down the trees for fuel. The use of firewood has very severe consequences to their

health. But we also recognize that Africa's female population needs to be engaged in development, either as consumers or even as providers; generating power and energy — even on a small scale — can be good business.

KM: Are Africans investing into local infrastructure?

AN: Given the AfDB's agenda, we need more African investors to be involved in Infrastructure development for the continent. Through information exchange, I am sure that African investors can tap into the opportunities that infrastructure investments afford and as such, they will familiarize themselves better as to how it is structured, how it generates returns and so on — particularly in the power generation space.

KM: Have you seen a significant uptick in private investment into Africa over the past five years?

AN: Yes there has certainly been a recognition of the various opportunities and the low hanging fruits Africa has to offer. For instance

the AfDB has seen a tripling in the business we do over the last 10 years and it is set to go even higher with the roll out of the High 5s. International investors increasingly recognize that African infrastructure is a really good asset class and I think we will see more activity as investors become more comfortable with doing business on the continent.

KM: I know KPMG professionals spend a lot of time helping international investors understand the complexities and opportunities of investing in Africa. Are there ways that the AfDB can help investors improve their success in these markets?

AN: Yes. We have a number of facilities to help support international investors as they work to engage with the private and public sector in Africa. No investor should feel helpless in Africa. There is help available; there is world-class advice available; and, most importantly, there are great opportunities to achieve both financial returns and social impact. ■

Quantifying the true value of infrastructure

By Adrian King

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Infrastucture owners, operators and promoters often talk about the 'intrinsic' value of their assets: reduced carbon emissions, better quality of life or improved safety, for example. Yet few infrastructure companies report the financial value of those benefits. Fewer still use that data to drive decision making across their business. According to one European railway operator — NS Group — the benefits of measuring environmental and socio-economic impacts in financial terms can be tremendous.

Changing expectations drive new approaches

As regulators, shareholders and customers start to demand greater transparency into the 'real' impact of their infrastructure, a number of organizations are starting to explore how they might quantify the value the company creates for society.

One such organization is NS Group, the largest public transport operator in the Netherlands. NS Group began to calculate its environmental impacts in financial terms using KPMG's True Value methodology. According to Carola Wijdoogen, Director of Corporate Sustainability at NS Group, the move to quantify its social and environmental impacts was driven by the need to meet society's expectations of the company. "NS's core purpose is to provide mobility for society and it is important that we show how we have fulfilled that core purpose," notes Ms. Wijdoogen.

While some organizations struggle to place a financial value on societal and environmental impacts, Ms. Wijdoogen believes that financial accounting actually enriches the value of the data. "In order to understand and compare all kinds of value creation, we have to use a common

denominator to express that value," she says. "We believe that the best common denominator is money."

Measuring the value

In 2015, the company released a report highlighting the financial value it creates, and reduces, for society. "Putting a financial value on our environmental and social impacts helps us to have fact-based discussions with our stakeholders about the trade-offs between sometimes conflicting values of people, planet and profit," notes Ms. Wijdoogen.

The largest positive impact came from the social value that its mobility services delivered which, on its own, was estimated at EUR7 billion. However, Ms. Wijdoogen notes that there were also around EUR5 billion in 'costs' to society related to time spent in trains, crowded or delayed trains or time passengers spent waiting at stations or changing trains. "We look at the entire journey from door to door and put a value on passengers' time," she adds.

The company also assessed its safety and environmental impacts which suggested that they had created some EUR560 million of positive value for society by enabling passengers to avoid car accidents (far outweighing the negative impacts of rail

accidents on customers and staff) and had created an estimated EUR196 million of positive environmental value through avoided externalities such as emissions from car journeys (but this was somewhat offset by an estimated EUR107 million of environmental costs, largely due to emissions from electricity used to power trains).

Making smarter decisions

According to Ms. Wijdoogen, this approach delivers far more insight than simply enabling an organization to quantify its footprint. "It helps us to prioritize our investments, for example when deciding whether to invest in reducing overcrowding, increasing parking at stations or improving the seating on our trains. This information helps us to understand how we can allocate resources in the most effective way possible to maximize the value we deliver to society," she explains.

By understanding its environmental impact in financial terms, NS Group is now focused on finding ways to reduce it. The company has committed to a 10-year agreement to use green electricity generated by offshore wind turbines which, in turn, enabled the wind farm to be built, adding new renewable generation capacity to the Dutch power industry.

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Putting a financial value on our environmental and social impacts helps us to have fact-based discussions with our stakeholders about the trade-offs between sometimes conflicting values of people, planet and profit.”

Carola Wijdoogen

Director of Corporate Sustainability, NS Group
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The analysis also uncovered areas where the organization would need to work with aligned partners to achieve incremental value. The safety assessment, for example, suggested that the most effective way to increase the safety value would be to improve the safety of journeys to the station rather than making improvements to the trains themselves.

The journey to quantifying social and environmental impacts

Ms. Wijdoogen's advice to other companies looking to value their social and environmental impacts is to start with manageable projects. "Don't make it too big. We started by focusing only on our environmental impacts. You need to take it step by step. If you want to do it, it can be done and there are people keen to help you, including academics and professional services firms. There are also other companies out there looking for the same answers, and there is a collaborative spirit among the innovative businesses that are pioneering this type of analysis."

However, Ms. Wijdoogen is also clear that the journey for the NS Group is only just starting. "So far we have measured

what we have already delivered in social and environmental terms. Our next challenge is to develop our true value analysis into a forward-looking tool that enables us to assess and compare potential investments and make decisions based on the social and environmental returns, as well as the financial returns. For instance, we have started to look at how we can improve the social and environmental value of using buses to reduce overcrowding on trains at rush-hour. We hope that will lead us to a better balance between people, planet and profit."

Lead from the top

Ms. Wijdoogen is proud to be leading her organization's charge towards more transparent reporting. However, she also believes that sustainability is core to the mission of the NS Group and, as such, argues that it should be owned and implemented by the whole company, not just by sustainability experts. "It starts with a belief that this is important; the process must be owned by those at the top of the company. If you are to succeed, then your decision to understand your true value creation must be aligned with your core values and purpose as a business." ■

Encouraging a culture of ethics

By Fernando Faria

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Creating an ethical and responsible culture in the infrastructure sector is not easy. But the bigger challenge often lies in driving that culture across the organization. And now, with many construction companies relying heavily on local contract workers to help deliver major projects, organizations are starting to place renewed focus on how they develop and train their employees, both permanent and contract.

Lead by respect

Brazil's construction companies are painfully aware of the importance of ethics. And while to date, Brazil's corruption investigation has focused on the bigger decision-makers, the scandal has also sharpened the focus on the relationship between construction companies and their employees.

For Clorivaldo Bisinoto, CEO of Andrade Gutierrez Construction (Brazil's second largest construction company with operations in 44 countries), the recent focus on employee conduct and ethical contracting represents another step in an ongoing evolution for the company. "Beginning in 2010, we started to shift our corporate culture from a 'command

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Whether the employee is trained on the job, in classrooms or even through online training, they need to understand the focus is on acting with integrity.”



Clorivaldo Bisinoto
CEO, Andrade Gutierrez Construction

and control’ approach to one that is much more collaborative in nature,” he noted. “Today, we aim to lead by respect and focus on encouraging a feeling of ‘belonging’ within the organization.”

With this change in leadership style, the company has tried to encourage a culture of open communication amongst employees. “We’d much rather someone tell us there is a problem than have them try to cover it up for fear of losing their job or being embarrassed,” he added.

Mr. Bisinoto attributes some of the company’s success to the development of standardized processes that bring consistency across the organization’s operations in Africa and South America. “Standardization of processes helps employees remain compliant,” he noted. “If there is no established standard or pattern, it’s easy for employees to start to set their own rules and quickly become non-compliant.”

An evolving story

Mr. Bisinoto has unique insight into how labor contracts have changed in the construction industry. He joined Andrade Gutierrez Construction in 1976 and has played a variety of key roles within the organization over the four decades, rising to the role of COO in 2013, and ultimately appointed as CEO in 2015.

He notes that the training of staff has become much more complicated over the years. “Thirty years ago, you could expect to have a sequence of projects that allowed the firm to retain staff after one project ended,” he noted. “But in the 1990s, hiring practices started to change and people started to be hired for one specific project and then let go and, as a result, both productivity and trust declined tremendously.”

While the current climate in Brazil makes hiring full time staff and regular contractors more difficult, Mr. Bisinoto is committed to reviving the ‘old ways’ where workers and companies could rely on each other in a relationship built on trust and mutual goals. However, he argues that — in Brazil and many other markets — labor laws are geared more towards ensuring job security rather than encouraging productivity. This, in turn, has led some companies to rely more heavily on temporary contract workers.

However, he believes that this will change in time. “I see a new generation emerging in Brazil — many of whom have studied overseas — who recognize that protectionism isn’t always the best way to defend workers’ rights,” he noted.

For the better good

For Mr. Bisinoto, the key is to focus on integrity across the organization. “The starting point must be integrity,” he said. “Whether the employee is trained on the job, in classrooms or even through online training, they need to understand the focus is on acting with integrity.”

He also notes the value of having a larger vision for the company. “Our employees are extremely proud of what we leave behind in communities and the impact our work has, particularly on poorer rural areas in Africa and Brazil,” he added. “It’s about reinforcing a culture that is proud of the social benefits we deliver.”

While his mission as CEO is undoubtedly to improve results and steer the company out of the recent scandals in Brazil, he argues that this cannot be achieved by reducing the company’s social contributions. “We have to focus on both in tandem; that’s the only way we will build a better world.” ■



The power of social license



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Withdrawing a project's 'social license' can stop the project. Infrastructure providers, owners and investors should take note: social risk is every bit as important as the better-understood technical risks of a project — and in the future possibly more so.

Securing a license

Infrastructure participants have been talking about the concept of social license for some time. It was initially created by the mining sector in an attempt to come to terms with the growing influence of social pressure on their investments and operations. The idea was that the local communities and society could either grant or revoke an organization's license to operate. It recognized that — every bit as much as legal licenses — a social license was required for any project that impacted the communities hosting them.

The fact that infrastructure participants are starting to adopt this concept is not surprising. The whole idea behind infrastructure is to impact communities and people in a positive way. And so virtually every project the sector undertakes must secure and maintain a social license.

The concept of social license has an uneasy relationship with a key tool of the infrastructure sector — social impact assessments (SIAs). Most infrastructure project owners conduct a SIA before they 'green light' a project. A SIA in some form, is usually required by authorities and is more often than not only scoped to meet regulatory requirements. This is despite project owners knowing that they could be slowed or stopped in the approvals stage if they do not have the broad acceptance of the communities they plan to impact. It is an approach that sees conducting SIAs as a compliance step towards achieving a legal license.

More than just an assessment

While SIAs that go beyond the scope of what is legally required are a good step, the reality is that few infrastructure players are going far enough to realize the full value of doing an SIA. Scoped well and the results used effectively it can be a powerful mechanism for understanding and predicting those impacts and issues that can threaten your social license. One problem is that most infrastructure owners and project managers tend to assess social impact at a point-in-time rather than across the full life cycle of the project — from design and construction through to delivery and operation. And, as such, they tend to

miss the signals that their social license may be in trouble.

There is also often a disconnect between the potential risk that social impacts may have and the priority placed on SIAs by project owners and engineers. Many simply refer to SIAs as a 'non-technical' input, essentially ranking it as subservient to other assessments such as financial feasibility or planning. Given that the loss of social license can scuttle a project in mid-stream or add exponential costs later in the project life cycle, it is important that project owners and managers start to systematically consider social risk on the same level as other project risks.

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Given the recent focus on whole-life costs and sustainability, project developers and constructors should instead be trying to 'own' and design out social risk as much as possible.”

Another major challenge is the ownership of social risk. All too often, project owners and developers essentially 'externalize' the risk to operations, preferring instead to focus on timetables and deadlines. But this is a mistake: problems are always much easier to fix in the design stage than once operations have begun. Given the recent focus on 'whole of life' costs and sustainability, project developers and constructors should instead be trying to 'own' and design out social risk as much as possible.

Upgrade your license

Infrastructure owners and managers have an opportunity to see and use SIAs differently.

Not only to gain the understanding that allows them to improve their relationship with local communities, but also to reduce risk and — in some cases — identify opportunities to drive improved value for those communities in a way that better protects their investments.

Impact assessments should be seen as a continuous management approach rather than done at a point-in-time. At the very least they should be conducted at regular intervals around major project milestones and changes — and should be adapted to reflect the changing social dynamics and the different phases of a project (social opinion often changes once the cranes start to go up). Project owners should also be paying more attention to how social risks evolve and change over time, course-correcting as the project progresses.

Infrastructure players could also be using their SIAs to uncover new opportunities to create value for community stakeholders and — ultimately — reduce the social risk over the lifespan of the asset. Are there opportunities to use local businesses or workers in the construction? Could a new local enterprise be created by allowing local communities access to some 'off takes'? Could the project be designed or developed in a way that encourages engagement from the local community? Often one small change in the initial design phase can make a massive difference in the way societies respond to infrastructure.

Don't lose it

Measuring the elasticity of a social license is not easy; some projects may enjoy wide leeway depending on the expected outcomes and benefits for the wider community. The exact boundaries of the social license can change overnight with community expectations being the key determinant. Ultimately, a social license is maintained by how responsive the project is to changing community concerns and challenges. It is a license that must be earned every day.

Executives and project owners will know when they've lost it. Society has a powerful ability to tell companies when they are no longer wanted. ■

How to build sustainable communities: Lessons from the UK

By Jan Crosby

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Sustainable economic growth and development requires sustainable communities. And while, for decades, the UK stood out as the pioneer of new and innovative approaches to creating sustainable housing, it has become increasingly clear recently that the country is now heading towards a major 'housing crisis'. Many are asking what went wrong.

Moving from developments to communities

By now, the link between stable communities and sustainable economies should be fairly clear. Indeed, for people to be productive they need to feel secure in their homes and communities; they need access to employment opportunities; and they need reliable infrastructure and government services.

Over the past few decades, many governments — the UK, the Netherlands and Germany, in particular — have put significant effort into building 'sustainable communities'. As David Orr, Chief Executive of the UK's National Housing Foundation notes, sustainable communities are about more than just affordable housing. "It's about social and economic sustainability," he says. "The challenge is to build places that are economically resilient, socially inclusive and where people can feel confident, secure and at peace."

For the most part, the effort to develop more sustainable communities has been based within the context of regeneration. From East Germany's grubby communist-era housing blocks through to massive housing estates in the UK, significant investment, political capital and effort has been poured into transforming older housing 'developments' into more sustainable 'communities'.

At the same time, governments, developers and investors are also increasingly adopting sustainable community concepts into new housing projects and plans. Yet according

to David Orr, there is still much room for improvement when designing and planning new communities. "Far too often, housing is being built without enough consideration as to the mix of infrastructure and services that the community will need to remain viable for the next 60, 70 or 80 years," adds Mr. Orr.

Financing models drive sustainability

The UK has long been a pioneer of the sustainable communities effort. Starting with the wider introduction of housing associations in the 1970s, the UK has put significant effort towards creating affordable and sustainable 'social housing' which is a key component of creating local acceptance of a new communities project and to making communities places where people want to live.

Along with home builders and community developers, the UK's housing associations have been key in helping drive the social discourse around what constitutes a sustainable community. "Through the housing associations, the UK has managed to achieve a lot of very high quality and very effective large-scale estate regenerations over the past 20 years," Mr. Orr notes. "I would argue that the UK's housing associations have been among the most effective public-private partnerships in the world."

The UK experience owes much of its success to the creation of new financing models that essentially allowed housing associations to buy their housing stock by borrowing against their anticipated rental income. But

to encourage regeneration, the purchase price of the assets would be discounted by the amount of capital required to improve the quality of the housing stock. If the asset is valued at, say, GBP100 million but requires GBP60 million to rehabilitate, the purchase price would be GBP40 million.

What this meant was that housing associations could issue bonds and raise capital from private investors against the long-term revenue stream and invest it into improvements. The model has been hugely successful. "Over the past few years in particular, we've become very successful at attracting large-scale institutional investment from the capital markets; more than GBP75 billion of private capital is now thought to be invested into the UK's housing associations," notes Mr. Orr.

The model does more than just create valuable investment opportunities, it also helps drive the politics of planning and creates a new paradigm in the relationship between developers, investors and the community. "Empowering the housing associations as owners allowed for much more community participation and resident engagement in the strategic thinking that underpins these projects," adds Mr. Orr. "It's encouraged more of a 'bottom-up' rather than 'top-down' approach."

A housing 'crisis' emerges

While the UK was once a pioneer, the past 5 years have seen a downgrading of regeneration and sustainability in the national

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Far too often, housing is being built without enough consideration as to the mix of infrastructure and services that the community will need to remain viable for the next 60, 70 or 80 years.”

David Orr

CEO, UK's National Housing Federation
@natfedDavid



housing agenda. “The pivotal moment was the 2010 Comprehensive Spending Review which started the government’s program of austerity economics,” notes Mr. Orr. “A lot of funding for regeneration projects essentially disappeared overnight.”

In early 2016, the debate around funding for sustainable communities entered a new phase. Decrying the state of what he called ‘sink estates’, UK Prime Minister David Cameron announced an initiative to reinvigorate the UK’s housing regeneration program. Backed by investments of around GBP140 million and a new Estates Regeneration Strategy, the program aims to transform 100 different housing estates across Britain.

As Mr. Orr notes, it will take more than new bricks and mortar to achieve this vision of transformation. “If the government’s ambition with the regeneration announcement is to be realized, they will need to think very hard about how they also balance investments into community support, job creation and the kinds of things that make places resilient, functional and sustainable,” he says.

Mr. Orr is optimistic that the objectives can be achieved. He points to a history of great successes and innovation in the UK housing market — from the introduction of the housing associations through to 20 years of executing successful large-scale regeneration programs. “We know how to do this successfully,” he notes. “What we needed was clearer public consensus about the fact that we are approaching a housing crisis.”

Build a legacy of sustainability

The challenge is that the creation of sustainable communities requires planners, developers, owners and governments to think holistically about the needs of the community. This, in turn, requires political leadership and support. “This isn’t about blindly raising the stock of available housing, it’s about politicians making the connection between housing policy, economic growth and sustainability and making the right decisions for the future,” Mr. Orr adds.

However, Mr. Orr warns that over-influence of government can also create obstacles. “The challenge comes when government wants

to be more involved in operational decision making rather than focusing on articulating what they want to deliver,” he adds. “Housing Association Boards need to get the steer from government but then need to be left alone to do what is in the best interest of their communities and what is needed to achieve their particular objectives.”

While government must play a key role, developers and investors must also step up to shape the sustainable communities agenda. “It’s rather easy to blame government but the reality is that developers also need to recognize that their job isn’t about building houses, it’s about being an integral part of ‘place-making’ and community-building,” he says.

For both the private and the public sector, legacy is key. Rather than just ‘build and flip’ houses or solve the short-term problem, developers and politicians need to think about the communities they want to see in 20 to 30 years. “If you are going to build a community, make it a place that you would want to come back to in 20 years, a place that you would be proud to say you helped build,” he adds. ■

**By the numbers:
UK housing**

- Between 2011 and 2014, there was a shortfall of 430,000 new homes in England.
- Over the course of the last parliament, almost one in three of all new homes built were affordable homes delivered by housing associations.
- One in every 10 houses in England is a housing association home.
- Housing associations built 50,000 homes last year, 40 percent of all new homes in England. Our plan ‘Ambition to Deliver’, published in 2014, shows how housing associations could more than double their output to deliver 120,000 homes a year.



Keeping infrastructure affordable



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As governments increasingly shift towards ‘user-pay’ mechanisms for infrastructure, concerns are rising about whether consumers can afford the growing cost burden. For governments seeking to renew their aging infrastructure, the challenge is even more acute: asking users to pay more for existing services is always a difficult (and often politically dangerous) proposition.

Jonathan Erling, KPMG in Canada, recently had the opportunity to sit down with **former regulator and regulatory economist, Cynthia Chaplin**, to discuss some of the challenges facing governments and infrastructure owners as they strive to renew their infrastructure affordably.

Jonathan Erling (JE): Governments are in a difficult position trying to balance between the need to deliver new infrastructure and the requirements of maintaining aging assets. The power sector is a particular challenge in that there is a clear desire to shift towards low-carbon and renewable generation sources, but also big questions about how these new assets will be funded. Are consumers willing to pay more for infrastructure?

Cynthia Chaplin (CC): I think the question often boils down to what people believe they are getting in return for their money. But there is a general problem when you are renewing baseline infrastructure because the perception is that you are asking people to pay more to get the same level of service. So you really need to be able to demonstrate some benefit or offer some new service in return for that investment.

JE: Most people certainly believe that reducing carbon is a long-term benefit, but I

suspect that enthusiasm for environmental alternatives starts to wane as the cost to the user rises. We’ve also seen governments struggle to properly quantify the real cost per ton of avoided emissions, which likely influences the public perception that the benefits of shifting to renewable power are unknown.

CC: Absolutely. If people perceive that it is costing more than it should or if it’s inordinately expensive then it undermines trust and people become less willing to accept new prices or structures. I think that is where regulators can play a very helpful role. Politicians can make the big policy decisions because they are then accountable to the electorate, but regulators can provide an alternative route for making some of those implementation decisions in a way that is sometimes more transparent and accountable.

JE: Another challenge is that ‘affordability’ is often an elastic concept that changes depending on economic climate,

perception and technological change. Solar and wind were simply not affordable just 10 years ago and now solar is — in many markets — achieving cost parity with traditional generation sources. How do you anticipate and manage changes in the ‘affordability envelope’ over time?

CC: It’s hard. And it requires you to really think about your infrastructure and investment decisions a little differently. In some cases, it might be that you don’t go for the one massive project that could solve everyone’s problems in one go. Instead you might decide to roll out smaller, more affordable projects that spread out the costs to consumers. If you own your home and you have 10 projects that need to be done, you generally don’t hire a contractor to do them all at once: it’s not affordable. You decide which projects can get done within the cost envelope you can afford and prioritize the rest for later.

JE: There is an interesting new dynamic at play in the power sector in general



in that consumers will soon have much more control over the cost of their energy. Simply put, if electricity costs become too expensive from the grid, users may simply purchase their own renewable energy kit and come off the network. It's already becoming a somewhat affordable alternative in many markets.

CC: That's where governments and regulators may want to be particularly concerned. Upgrade costs and capital expenditures are ultimately shared by the people who use those assets. If we start to lose users from the grid, the cost of the upgrades will need to be shared by a smaller and smaller group of users. Layer in the idea that home generation will be expensive at first — and therefore affordable to only the affluent — that means that upgrade costs are now falling on the shoulders of those that really can't afford them.

JE: *That really raises the risk for infrastructure investors. The sector is trying to build or renew assets that will last 40 or 50 years but we really don't know what our power needs will be in the future or even what our generation mix will look like. If people are generating their own power, do we still need a distribution network? Clearly there's a point beyond which affordability becomes a risk for owners and investors.*

CC: We can use the distribution and transmission grids to deliver and receive services from distributed resources, although those grids will need upgrades to accommodate more distributed resources. For the larger centralized generation projects, I think most operators — at least in the electricity sector — are fairly attuned to the regulatory risks, political risks and market risks that they face. But

we've certainly seen some governments start to add some optionality into their contracts, essentially allowing them to halt development of long-term projects if they believe that the affordability equation has changed too much. Most of the time, costs are covered but I think governments recognize that the most unaffordable assets may become the stranded ones.

JE: *Many believe that the provision of affordable infrastructure is a moral responsibility of government. What influence should morality have on the affordability debate?*

CC: I'm an economist so I look at it as an economic policy question before I even start talking about the morality of it. The simple fact is that governments want people to be productive — it's the best thing for the economy — but to do that, people need access to affordable infrastructure. I think you can make a very practical economic case that making infrastructure affordable adds to the economy. How governments go about doing that — whether through subsidies, tax distribution processes or rate-payer subsidies for those that can't afford it — depends on the local realities and circumstances.

JE: *The challenge becomes rather complex once you start to add in other investment requirements like resilience improvements and cyber security protections. But who should be making the decision on what exactly is affordable for consumers? Is that the role of governments who are accountable to the population but tend to think in political cycles, or is it the role of the regulators who tend to see the long-term picture but are not accountable to voters?*

“

The simple fact is that governments want people to be productive — it's the best thing for the economy — but to do that, people need access to affordable infrastructure. ”



Cynthia Chaplin

Former regulator and regulatory economist

CC: I think there is a clear role for both government and regulators. Government must set the overall policy direction and the objectives and hopefully rely on market forces in competitive areas to ensure the results are affordable. For the non-competitive areas, the regulator can make the implementation decisions in a transparent and open way that ensures that the impacts are well considered and that people have a chance to have their voice heard. Unfortunately, regulators have sometimes been leery of making decisions for direct rate support, and sometimes what it takes is a political push, either through legislation or policy, to instruct the regulator to put in place certain programs. I think regulators should be playing a stronger role in the decision making around policy implementation.

JE: *I suspect technology will make the debate even more complex. Some markets already charge differential pricing for time of day usage and smart meters allow infrastructure operators to know exactly who is using how much power and when. Cost allocation can become much more precise than before. But this raises the ire of certain groups that have heretofore benefited from the averaging of costs over different classes of users. Should the regulator be trying to protect consumers from changes in cost allocation?*

CC: Technology and shifting public and social values are clearly changing the equation. But what is certain is that affordability will always be a key challenge for infrastructure owners. The dynamics may change but the core issue will remain: can people afford their infrastructure? ■

A vision for development: Kenya's Vision 2030

By James Woodward
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Kenya is enjoying strong growth and significant improvements in quality of life. Driving this growth and development is Kenya's Vision 2030, a long-term development plan for the country. With a strong focus on improving the country's infrastructure, among other initiatives, the government has taken a number of steps to make Kenya's infrastructure more attractive to foreign and private investors. All signs indicate that their hard work is starting to pay off.

From the fertile lands of the Rift Valley to the bustling port of Mombasa, Kenya is clearly enjoying a period of growth and prosperity. The country is already the largest economy in East and Central Africa and serves as a regional center for banking, technology and transportation. Between 2004 and 2014, Gross Domestic Product (GDP) per capita

almost tripled.¹ And between 2012 and 2014, foreign direct investment inflows jumped from US\$259 million to almost US\$1 billion.²

The need for a vision

While Kenya has long been viewed as one of Africa's most politically and economically stable markets, violence erupted in 2007 on

the heels of disputed election results. Peace and security were quickly restored, but the period raised a number of significant political, social and economic questions for the country.

"We recognized that we really needed a long-term view of how we wanted to develop as a country and how we planned to improve the quality of life for all Kenyans,

¹ <http://data.worldbank.org/indicator/NY.GDP.MKTPCD?page=2>
² <http://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD>

and in particular the poor, and that led us to develop Kenya's Vision 2030," noted Professor Gituro Wainaina who serves as the Acting Director General of Kenya's Vision 2030 Delivery Secretariat.

A transformative plan

Vision 2030 is intended to transform Kenya into a "newly industrializing, middle-income country providing a high quality of life to all its citizens by 2030 in a clean and secure environment." The plan is based on three pillars (economic, social and political) and embeds a set of values that defines what the country hopes to achieve and how it hopes to achieve it. The economic pillar aims to achieve and sustain an average economic growth rate of 10 percent per annum until 2030, the social pillar seeks to build a just and cohesive society with social equity and the political pillar aims to realize a democratic political system founded on issue-based politics that respects the rule of law, and protects the rights and freedoms of every individual in Kenyan society. The three pillars are anchored on enablers and macro as the foundations.

The implementation of Vision 2030 is a progressive process with goals and milestones that will be achieved over time. It is implemented in successive 5-year cycles called Medium Term Plans (MTPs). The first MTP was implemented between 2008 and 2012 and the second MTP is being implemented in the period 2013 to 2017.

Rather than an opportunistic political manifesto, Vision 2030's plan is entrenched into the country's Constitution 2010, a move that Professor Wainaina says provides popular support and longevity. "The Constitution 2010 provided transparency into how government deals with businesses and citizens, it created important structures and institutions, it articulated the relationship between the two levels of government at the national and county levels and — most importantly — it gave Kenyans a direct voice in the development of the constitution," noted Professor Wainaina. "We are extremely proud of our constitution and credit it with much of our success since 2010."

Aligning politics with long-term vision

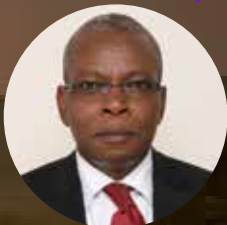
Astute timing and prudent cooperation in developing the Vision's MTPs has also been key to providing stability and confidence in the initiative's long-term goals. The MTPs are designed for five years and to coincide with Kenya's general election cycle.

"We appreciate that politics is very important to the development work that we do and we try as much as possible to implement the Vision in harmony with the election cycle," explained Professor Wainaina. "All of Kenya's main parties base their platforms on the Vision

2030 plan and so we work with them during their campaigns to help them understand the implications of their ideas on the Vision and the long-term development goals we have set."

Sometimes that means cooperating with the new government to integrate platform promises into the Vision 2030 agenda. "The current MTP was adopted in 2013 and includes a strong focus on digital transformation to respond to the government's platform of providing every child with a laptop by January 2017 under the digital literacy project," he noted.

“All of Kenya’s main parties base their platforms on the Vision 2030 plan and so we work with them during their campaigns to help them understand the implications of their ideas on the Vision and the long-term development goals we have set.”



Professor Gituro Wainaina
Acting Director General, Kenya's
Vision 2030 Delivery Secretariat

Infrastructure at the core

From the outset, Kenya's government recognized that the Vision could only be enabled through investment into infrastructure. "If we want to improve access to healthcare, we need to build roads that can take people to hospitals; if we want to improve tourism, we need to improve our ports and airports; if we want to create new business opportunities, we need to invest more in our Information and Communication Technology (ICT) infrastructure," added Professor Wainaina. "Infrastructure is the foundation that holds up each of the three pillars in our Vision."

Kenya has already enjoyed some success in key areas. A new 50-kilometer eight-lane controlled-access highway was built between Nairobi and Thika, linking several towns to the capital's North East. Investments into renewable power and the 'last mile initiative' have seen electricity rates fall from 19 cents per kilowatt hour to around 11 cents today. And dredging at the Port of Mombasa has reduced ship turn-around times from 18 days to just 2 days.

Improving the investment climate

Like all governments around the world, there are limits on how much of Kenya's infrastructure can be funded from the public purse. "The only way we will be able to deliver on Vision 2030 is through public-private partnerships (PPPs) and so we have been very focused on creating the right environment to attract private and foreign investors," noted Professor Wainaina. "We have had successful PPPs in the past, but the PPP Act of 2013 really helped articulate how the private sector can support the government in this initiative."

The government has undertaken a number of initiatives to improve the investment climate. For example, recognizing that procurement processes had become contentious and time-consuming, the government has focused on improving the use of technology to drive efficiency across the procurement life cycle.

Specialized courts have also been established to deal with procurement challenges and contractual issues. And soon a law will be enacted that requires those bringing failed challenges to court to pay the legal fees. "Currently, companies can dispute awards in the courts for years — often with little or no basis of claim — which not only slows the process but also adds to investor uncertainty," added Professor Wainaina.

Reaping the benefits

Professor Wainaina notes that Kenya is already enjoying benefits from the Vision. "We've attracted dozens of global businesses — like Google, IBM and Virgin Atlantic — who have made Kenya their headquarters for Africa and serious investors are recognizing that Kenya offers the best opportunity to build a presence in Africa because of our people, our skills, the ease of doing business and our investment into infrastructure," he added.

But he warns that Kenya does have one pitfall for foreign investors and business people: "Once you come to Kenya you won't want to leave," he notes. And he's absolutely right: I came to Kenya from Australia in 2009 and have no intention of ever leaving. ■

SIBS

Unlocking a new payment model for infrastructure



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Assessing social and governance risks of prospective infrastructure projects is common practice to avoid exploitative labor practices, violations of environmental law, or the implications of displacing communities. The intention is to understand potential adverse impacts on the project and quantify the cost of risk mitigation as well as the risk itself when pricing projects.

At its core, infrastructure directly enables mobility and competitiveness, as well as a more inclusive society by helping to remove barriers that prevent certain groups of citizens from fully participating in the economy. Addressing the social needs of communities are inherent in infrastructure projects that provide access to essentials such as health care, education, affordable housing and environmental benefits in projects that produce renewable energy.

Are we missing an opportunity by not explicitly considering the net positive social and environmental value created through infrastructure projects? What if we incorporated social outcomes as part of the evaluation requirements or as part of a performance bonus? Would this result in better investment

decisions? Better outcomes for society? As the adverse impact of social issues are increasingly being quantified in economic terms — is it time to more intentionally consider the positive impact created to help prioritize decision making regarding infrastructure projects?

An appetite for outcomes

Governments have increasingly been shifting the way they think about meeting the social needs of its citizens by moving from the more traditional fee for service approach to procuring services from non-government organizations (NGOs) or other service delivery agencies, to procuring social outcomes. When, in 2010, the UK announced that it would be piloting a new approach to delivering social services, governments around the world took notice.

Rather than paying service providers for the investment and resources they put into delivering a service, the government aimed to instead pay them for the specific outcomes they achieved. And 'Social Impact Bonds' or SIBs were born.

The term 'Social Impact Bond' is actually somewhat of a misnomer. They are not strictly 'bonds' as they take the form of a typical debt instrument. Nor are they contingent on a broader idea of 'social impact' but rather on a carefully pre-defined set of performance measures that are indicators of social impact to be achieved over the longer-term. In fact, rather than a SIB, these approaches would be more accurately described as 'pay for performance' or 'pay for outcomes' contracts.

A good idea spreads

Regardless of what they are called, they are clearly enjoying significant attention and experimentation in key markets around the world spreading from the UK to countries across Europe and also including Australia, Israel, the United States and Canada, spotlighting infrastructure needs in the developed world. Similarly, Development Impact Bonds are also gaining traction, which seek to attract financing of projects in developing nations. Since the early days in 2010, more than 50 different SIBs have been established covering a wide variety of issue areas such as reducing recidivism, preventative health measures and early childhood education.

This approach has attracted the interest of government. In part, because they enable the public sector to de-risk the delivery and cost of preventative social services by having private investors fund the initial delivery of the intervention, by providing better value for taxpayer money by paying for outcomes rather than inputs. Investors also see this as a means to leverage their capital to drive measureable improvements in society and to earn a return based on the avoided costs to government as the intervention has reduced long-term dependency on social programming. The key is how the risks are priced.

A journey, not a destination

SIBs are a stepping stone towards a much broader approach to pay for performance and ways to incorporate social outcomes into the financial analysis and pricing of service delivery and infrastructure projects. A recent report by the Brookings Institute assessing the lessons learned from the experience of early SIBs found they have been successful in shifting the focus to outcomes and increasing investment in preventative interventions. The report also highlighted the challenge of achieving scale, as SIB pilots typically

engage a limited population. By comparison, infrastructure projects are large scale often impacting multiple communities and providing a natural platform to quantify benefits.

Quantifying the social outcomes created by infrastructure projects and incorporating them as part of business case development and performance incentives aligns with our call for public-private partnerships to prioritize a new set of 'P's' — people, planet and prosperity — to address the increasing focus on infrastructure morality and how to accomplish the significant demand for infrastructure development and the resulting economic potential.

“SIBs are a stepping stone towards a much broader approach to pay for performance and ways to incorporate social outcomes into the financial analysis and pricing of service delivery and infrastructure projects.”

A parallel can be drawn to the private sector. Businesses are increasingly interested in understanding both the positive and negative social, environmental and economic impacts of their business on society, and how the net impact could affect earnings over the longer-term. Our

True Value methodology has helped our clients monetize these externalities and use this information to more effectively prioritize business initiatives that will enhance competitive advantage and reduce risk in the future.

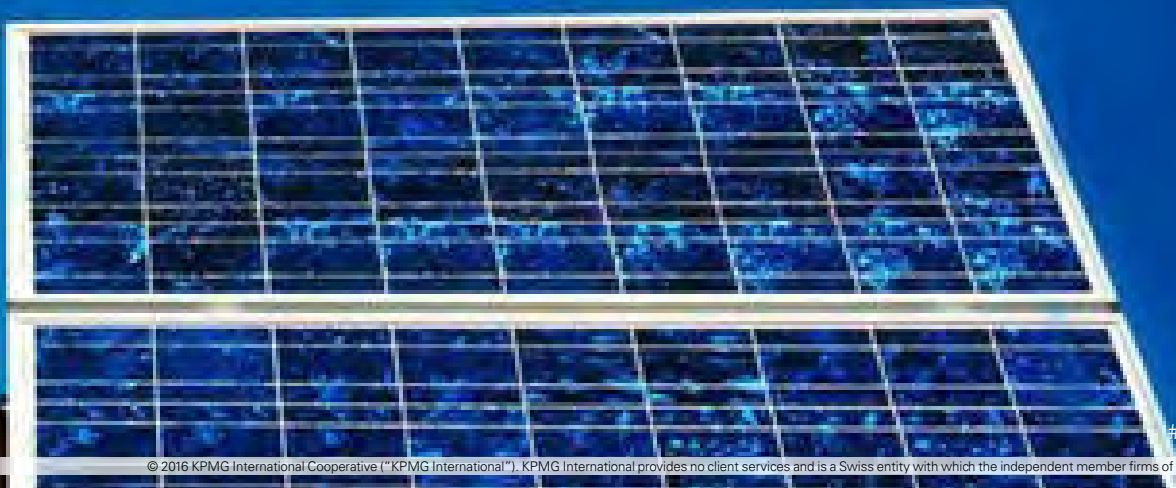
What is already very clear, however, is that these new models and approaches are catalyzing fundamental change in the way governments approach infrastructure and service delivery. As more and more projects reach their objectives and governments start to calculate the value created for society, we expect to see elements of the pay for performance model start to emerge across government contracting and projects more broadly.

Vision and effort required

Transforming the model will not be easy and will take significant work from government, investors and developers. At a strategic level, governments will need to assess the societal context and where they see outcomes that could influence the new model. They will also need to examine their policies, regulations and legislation to create a more supportive environment for investment into pay for performance schemes.

The private sector and infrastructure investors will also need to adapt. Understanding the risk-sharing and payment mechanisms will take some time and investors will need to start adjusting their projections to reflect the growing influence of performance-based incentives. At the same time, they will also benefit from broadening their perception of how their investments can influence social outcomes; proactively understanding and measuring social impacts will be key to demonstrating value in the future.

A new approach is emerging and it may very well transform the way we pay for and invest into infrastructure. Investors, developers and governments had best be prepared. ■



Creating opportunity: Diversifying the workforce

By Richard Threlfall

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*Infrastructure developers and contractors generate value for society in two main ways: through the assets they create and deliver, and through the employment opportunities they provide to local communities. As a sector, we do a great job reporting on the social benefits of our developments. And now, according to **Christine Townley, Executive Director of the UK's Construction Youth Trust**, it's time to focus on creating better social benefits through training and employment.*

Since the dawn of time, construction has been a valuable source of employment for people around the world. Today, more than 6 percent of the UK's total workforce is employed in construction.¹ And more than 12 million people across the EU are employed by formal construction companies (not counting independent contractors).² The economic benefits of these construction jobs within an economy is well documented.

Yet construction jobs are also particularly valuable to society because they are often the first (and sometimes only) employment opportunity available to those who tend to need employment the most: the disadvantaged, young people and those reintegrating into society.

Ms. Townley believes the infrastructure sector has an important role to play in helping integrate young people and

disadvantaged groups into the workforce.

"Infrastructure projects are often massive, long term and impactful and are great at capturing people's attention," she noted. "I think the infrastructure sector has the ability to draw young people towards a career in construction and, in doing so, help develop skills and apprenticeships that get the neediest in to work."

A matter of survival

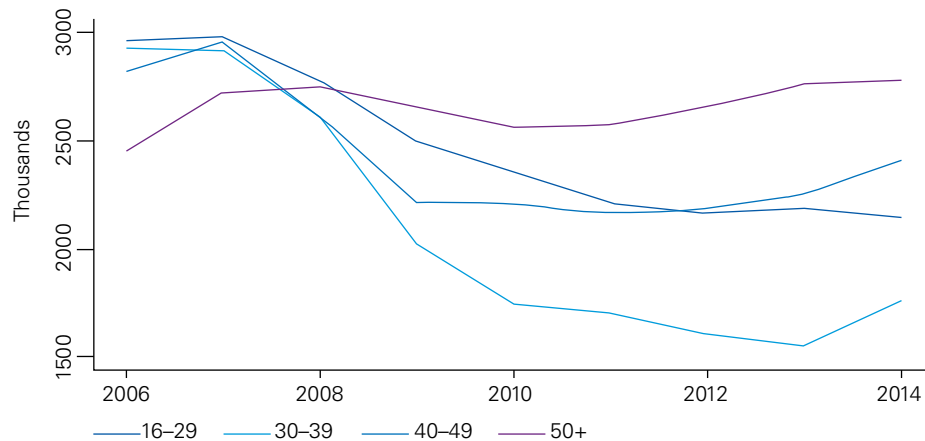
Diversifying the workforce and encouraging participation of young people should not be a purely altruistic goal for developers and contractors. Data from the US clearly illustrates the looming talent gap: there are almost twice as many construction employees aged 50 years or older in the US as there are those under 30. And when construction slowed in the wake of the financial crisis, it was employees under 30 that were hardest hit.³

1 <http://researchbriefings.files.parliament.uk/documents/SN01432/SN01432.pdf>

2 http://ec.europa.eu/eurostat/statistics-explained/index.php/Construction_statistics_-_NACE_Rev_2



Construction employment by age



Source: Current Population Survey Annual Social and Economic Supplement

“If construction companies want to bid for longer-term contracts, they are going to need workers and that means they really need to start encouraging young people to enter the industry now,” added Ms. Townley.

At the same time, construction companies are also starting to recognize the value of diversity within their workforce. “There are a growing number of studies that prove the value of gender diversity in the workforce and increasingly on the construction job site; I frequently hear from foremen and developers who say that female employees are often more productive and easier on the machinery, which means less downtime over the project.”

More support needed

While governments and developers are increasingly starting to recognize the social, economic and business benefits of attracting young people to the construction sector, the unfortunate reality is that not nearly enough is currently being done. In fact, in the UK — arguably one of the more advanced economies in the world — the role of encouraging young people to join the sector largely falls on organizations such as Construction Youth Trust.

With no central government support, funding can be difficult. “We have strong supporters in the industry including infrastructure clients like Network Rail who help fund certain programs and others that donate time and offer opportunities,” noted Ms. Townley. “We’ve also benefited from pockets of money from local authorities and local government, but that doesn’t provide the steady stream of consistent revenue we need to run our programs and achieve our objectives.”

Of course, Construction Youth Trust is not alone in its goal of encouraging young people to join the sector. Crossrail’s Tunnelling and Underground Construction Academy (TUCA) has trained more than 10,000 people since its establishment by the consortium that includes Transport for London and Network Rail. Today, almost a third of Crossrail’s jobs are filled by

women.⁴ And more than 13,000 students visited the facility over the past year to learn more about working in the sector.

“There are great programs and initiatives underway across the country, large and small,” added Ms. Townley. “About 10 years ago I met a man responsible for maintaining council houses in Leicester who was a big champion of diversity and fought hard to attract women into his department. But he did it because he knew it was the right thing to do, not because of a government program or incentive.”

Knowing where to start

Part of the challenge in the UK — and many other markets around the world — is that the way construction companies contract with workers has evolved from an industry largely dominated by direct employment to one instead characterized by individual contractors and so-called ‘Tier 2’ suppliers. As a result, some companies have been reluctant to invest into training individuals who may simply move to a higher-paying opportunity once they have developed their skills.

However, the reality is that there is always the risk that well-trained employees will be poached by a competitor and — just like any other company that values highly-trained talent — construction companies will need to focus on retaining them. “I believe we have an obligation to keep on encouraging new talent to enter the sector and to keep training them in order to raise up our national capability and improve access to employment for young people and the disadvantaged,” added Ms. Townley.

While Ms. Townley certainly praises the private sector for the efforts they have made to date, she believes there is much more to be done. “I think government and the private sector do care about the issues, but my experience suggests that some organizations just aren’t sure where to start — they want to do something but don’t know how to.”

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Our mission is to enhance young peoples’ lives, and hopefully get them jobs in construction and we do that by removing barriers such as gender, ethnicity, finance and other elements.”



Christine Townley

Executive Director, UK’s
Construction Youth Trust
@christine_CYT

Helping people to help themselves

Construction Youth Trust focuses its attention into three main areas: educating young people about opportunities in the construction sector (a program called Budding Brunels); giving young people a ‘taste of the trades’ through on-site courses (the Budding Builders program); and managing bursaries to help support individuals seeking training in the sector.

“Our mission is to enhance young peoples’ lives, and hopefully get them jobs in construction and we do that by removing barriers such as gender, ethnicity, finance and other elements,” noted Ms. Townley. “We’re particularly focused on the disadvantaged and young people, either through the Schools Initiative to help them actually understand what the professions and trades are like or by working with people who are not in employment, education or training and helping them maybe get their first job.”

Ultimately, Ms. Townley believes that the government and private sector will need to work together to encourage young people into the construction and infrastructure sectors. “Government needs to flex its muscles and use its buying power to make a difference and help communities get work; for their part, companies need to take a risk and recognize that their future depends on fostering the talent of tomorrow today,” she added.

For those companies that are not sure where to start, Ms. Townley and the Construction Youth Trust team are keen to offer ideas. “Help us to help young people to help themselves,” she suggests. ■

3 <http://www.federalreserve.gov/econresdata/notes/feds-notes/2015/where-are-the-construction-workers-20150226.html>

4 <http://www.crossrail.co.uk/careers/engineer-your-future>

What infrastructure players need to know about social listening



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Many of the articles in this edition of *Insight* magazine argue that social engagement is key to ensuring that infrastructure is moral, valuable and good for society. The big question, therefore, is not whether to listen to community stakeholders, but rather how. We believe social ‘listening’ and predictions are central to social engagement and, ultimately, project success.

A powerful and sophisticated tool

If you are reading this publication, you probably have a working understanding of social media. You almost certainly have a LinkedIn profile, maybe even a Facebook page. And if you are an executive at a ‘public-facing’ company — say a utility or a transit system — you probably also have a Twitter profile (albeit managed by your corporate communications team).

What you may not recognize, however, is how sophisticated and how powerful social media has become. The technological sophistication is hard to deny; in just a decade, social media has become all-pervasive and all-knowing — its algorithms and network effect unparalleled in their ease and elegance.

More importantly, it has also gained sophistication of pedigree. Today’s ‘traditional’ media (now largely hollowed out of resources and researchers) tend to see social media as a reliable and trustworthy source. Politicians use social media as a grassroots vehicle to

communicate with their constituents. And even banks see social media as a channel that can help them rebuild trust with their stakeholders. No longer the belligerent adolescent; social media has become mature and sophisticated.

This sophistication makes social media extremely powerful. Trusted and now virtually ubiquitous, social media connects people and groups around common causes and passions. More importantly, it removes barriers between people and empowers individuals. Indeed, whereas in the past, corporations tended to hold the power through access to media, politicians and advertising, social media has leveled the playing field and — if anything — shifted power to the individual.

Great opportunity comes with great risk

For infrastructure developers, investors and owners, the growing sophistication and power of social media is far more than an



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It requires a deeper understanding of nuances such as the history of the key actors and influencers, the velocity and veracity of the conversations and the connections between other likeminded groups or influencers.”

interesting development; it is a massive opportunity and a massive risk.

Let's start with the risk. Left unmanaged, social media has the power to delay projects, add unexpected costs and — in extreme cases — lead to project failure. In part, this is because social media users (particularly those born into the digital world) have also become increasingly sophisticated and powerful. Social activists even more so; having been virtually locked out of the traditional media for decades, most activists quickly became adept social media users and now understand how to harness the channel to achieve their goals.

But it's not just social activists that have become adept social media users. So, too, have investors. In fact, we have worked with a number of large institutional investors who have used information taken from social media to inform their investment decisions. In some cases, they have passed over financially sound investments due to potential issues they noted on social media.

The flip side of risk is opportunity. And the opportunity for social media savvy infrastructure players is equally strong. By leveraging information from social media, infrastructure developers and owners could avoid the types of delays, costs and reputational damage that can result from a social backlash to a project. They can identify and mitigate risks before they arise. And they can predict — even before shovels hit the

dirt — how various segments of society and the local community will respond to certain activities and actions surrounding their project.

Our experience suggests that virtually every non-technical delay on an infrastructure project could be avoided if executives had paid better attention to what social media was telling them. All too often, signs of major issues first appear on social media. Those who know how to listen to those signs can also be the ones that avoid them.

Think deeper

Many infrastructure executives may believe that they already do a fairly good job at listening to social media. They likely have a handful of digital natives and millennials stashed away within the marketing department who monitor their brand, respond to customer comments and post service updates.

However, we do not believe that this level of social listening goes nearly far enough given the massive risks and opportunities that social media represents. Real social media listening is about more than simply tracking brand mentions, net promoter scores and positive/negative sentiment. It requires a deeper understanding of nuances such as the history of the key actors and influencers, the velocity and veracity of the conversations and the connections between other likeminded groups or influencers.

Part art and part science, the value of social media listening often depends on the capabilities of those analyzing the data. More than just experience in marketing, social listening requires the combination of wide-ranging disciplines such as demographics, mathematics, sociology, engineering, psychology and analytics in order to deliver truly valuable insights.

From reactive to predictive

For the most part, current social media listening activities in the infrastructure sector tend to focus on managing immediate and current issues. Key topics are monitored in real-time, shifts in the mood or the pace of the discussion are analyzed and executives are informed — often through a bi-weekly dashboard or monthly report — on the current level and potential impact of key

non-technical risks. This has proven to be an extremely valuable activity for risk and crisis management, helping executives defend and mitigate issues as they arise.

More exciting however, is the predictive nature of social listening. This is where early signals of trends are captured and analyzed, potential scenarios are plotted based on experience and social models, and responses are tested in the court of social media to predict fairly accurately how a segment of the population or community area will respond to various factors.

Start listening

How can infrastructure participants start really listening to social media? First, executives will need to carefully assess who should own responsibility for social media within the organization. Whether it remains within marketing and sales or whether it is consolidated under the risk management function within the executive team, organizations need to be very clear about the risks and opportunities that social media represents.

Next, infrastructure executives will need to focus on finding, retaining and developing the right mix of capabilities, tools and talent to drive actionable and practical insights from their social media data. This is still largely an emerging field; finding individuals with skills and a track record will be difficult for the time being.

The most important step, however, is what executives do with the insights and predictions that their social listening efforts deliver. Having the right governance models, risk management frameworks and controls to ensure that information is turning into action will be key.

Don't add to your risk

Ultimately, we believe that infrastructure organizations and their leaders need to recognize that social media simply can't be ignored. To do so would be to add a new dimension of risk that could be avoided. And with social media increasingly acting as a force of convergence between traditional media, social activists, financial analysts and politicians, it seems clear that the risks are only set to rise. ■

Electrifying India with renewables

By **Santosh Kamath**

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I firmly believe that anyone working in the renewables sector — investors, developers, engineers and others — need to work with passion and not be all-consumed by the profits and economics for now. ”



Tarun Kapoor

Joint Secretary, India's Ministry of
New and Renewable Energy

India's government is striving to achieve some massive electrification objectives. On the one hand, India's government wants to deliver on its promise to deliver 'electricity to all' by 2019. At the same time, the government aims to increase the country's total renewable power generation capacity to 175 Gigawatts (GW) by 2020.

According to **Tarun Kapoor, Joint Secretary with India's Ministry of New and Renewable Energy**, renewable power will play a key role in achieving the government's electrification agenda. Recently, **Santosh Kamath, KPMG in India**, sat down with the Joint Secretary to talk about the challenges and opportunities ahead.

Santosh Kamath (SK): India has set very aggressive targets for renewables. Are the targets achievable?

Tarun Kapoor (TK): Right now, India's total renewable capacity is around 42GW of installed capacity and that accounts for between 6 to 7 percent of the energy currently going into the grid. The aim is to take it to 15 percent by 2020 and — if we achieve our objective of 175GWs by 2022 — we will be at 17 percent. It might be very difficult but I believe we can achieve it.

SK: What are some of the challenges you worry about when working towards this goal?

TK: I think there are three big challenges. The first is transmission because most of the renewable power will come from wind and solar so we will need to focus on building transmission lines out to the solar parks and wind turbines, which are often in more remote parts of the country. The second challenge is around the continued willingness of the distribution companies to buy increasing amounts of renewable power, particularly since some of them are already in a surplus situation. And the third challenge is bringing in low-cost financing because renewables can often be a very capital intensive proposition.

SK: What role will renewables play in the government's electrification program?

TK: There are around 18,000 villages that are not electrified and about 3,500 of those cannot be connected to the grid, either due to cost or practicality. So those villages will need to be supplied through standalone renewable sources, mainly solar. There are also significant areas of the country where power simply isn't reliable so we are working to develop standalone renewable generation in those locations to help 'even out' the power supply.

SK: I understand the government is also working to install a significant number of solar water pumps throughout the country.

TK: Yes. In fact, there are already about 60,000 installed and plans are in place to install another 150,000 or so in the next 2 to 3 years. India has around 25 million water pumps used for farm irrigation and these consume approximately 20 percent of the total grid supply of power. Many of the solar pumps are fairly simple pumps, but we are also working with farmers to install 25 to 50 horsepower pumps that can supply water into the irrigation system. And we have proposals to put up small solar plants in farming areas to feed power into the system during the daytime when the farmers need it most.

SK: What role should the government play in funding renewables to achieve the electrification agenda?

TK: The power sector as a whole is a commercial sector that generally doesn't need extra money from tax payers or the government but there are some sectors that will need additional investment. If you have a village with just 100 houses that needs a line to the grid, you can't just load the cost of that connection onto the 100 families that live there because they probably can't afford it. But in other parts of the country, the cost of connecting a consumer is not very high, so you really need to look at how you cross-subsidize that and use money from the whole power sector. Further, the government has made a budgetary outlay to fund rural electrification that have provisions for renewable based mini and micro-grids.

SK: Will affordability become a bigger issue as more renewable power comes into the network?

TK: I think that — over the past 4 or 5 decades — we have not been very good at

communicating the cost that was required to develop the system so people don't really appreciate that a new system will cost money. Once we get to a larger scale, however, I think the question of affordability becomes less of a problem. Solar power has already fallen to rates of just INR 4.5 per kilowatt hour, so it's already quite comparable to other power sources.

SK: Do you envision a world without fossil fuels?

TK: I firmly believe that anyone working in the renewables sector — investors, developers, engineers and others — need to work with passion and not be all-consumed by the profits and economics for now. Those are certainly important, particularly if we want a sustainable renewables sector. But we need passion and dedication to the mission of eliminating fossil fuels. We need to always keep that goal in mind and make sure that we don't shut down new ideas.

SK: Can foreign investors and developers play a role in helping achieve India's renewables and electrification objectives?

TK: Absolutely. India is a fantastic market for renewables and we welcome investments, ideas and technology from all over the world. Policies in India have changed significantly and there are essentially no restrictions and no entry barriers with the opportunity to maintain 100 percent ownership (FDI) in renewables. We really need affordable and clean power and are looking for investments of around US\$200 billion over the next 5 to 7 years to achieve our agenda. I think that should interest many large companies and investors. ■

Feeding the continent: Unlocking Africa's potential



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Africa's cities are abuzz with opportunity, potential and — importantly — new infrastructure. Yet outside of the cities, the pace of change has been stubbornly slow. This is a bigger problem than it may seem: Africa's growing cities need food, labor and resources to achieve their full potential and that, in turn, requires efficient and effective rural infrastructure. So if you are betting on Africa's cities, you have better also be betting on its rural infrastructure.

While Africa may not be the fastest growing continent, many observers think it has the strongest long-term potential. Population trends suggest a massive demographic dividend; Africa will surpass China in terms of working age population by 2040. Productivity is steadily rising; gross domestic product

(GDP) in Sub-Saharan Africa rose by around 5 percent each year between 2008 and 2014. Security and rule of law is improving quickly and Africa's markets compare favorably to China and India in the UN's Ease of Doing Business rankings.

Perhaps not surprisingly, much of the focus has been on Africa's fast-emerging

cities. Africa is expected to see the highest rates of urbanization between 2020 to 2050. And by 2030 the continent will boast around a dozen cities with populations of more than 5 million people. For foreign investors and local politicians alike, Africa's cities are crucially important to future growth.

Nourishing growth

The problem is that Africa's growth trajectory is simply unsustainable without a significant change in the way rural infrastructure is planned, funded and delivered. The reality is that cities need food in order to be productive; businesses require labor; and industry requires resources. Without rural infrastructure, either costs will increase or productivity will decrease.

Agriculture also remains an extremely important industry for most Africans and African countries. Today, almost two-thirds of Africa's labor force is employed in agriculture meaning that any improvements in the sector tend to have broad-based benefits for the wider population. At the same time, almost a third of Africa's GDP currently comes from the fields.¹ As many other markets have found in the past, improving the value of agricultural production is a clear path to driving economic growth.

The importance of agriculture is not lost on most of Africa's governments. Kenya's Vision 2030 development strategy notes the importance of the sector in helping to drive GDP growth to 10 percent per year by 2030. Other governments — from Ethiopia through to South Africa — have championed the value of the agricultural sector.

Yet agricultural output from Africa remains small. Indeed, the continent as a whole exports less farm produce than Thailand.² And the vast majority of what is grown in the fields never reaches Africa's cities. Instead, it is sold at local markets, eaten by farmers or — far too often — eaten by weevils.

A rough road to market

Part of Africa's agricultural challenge comes down to land ownership. In many cases, landholdings are too small to encourage farmers to modernize. Far too few of those that work the land have ownership over the land, which discourages investment and the adoption of sustainable farming practices (such as leaving fields fallow). And much of the land now being converted to cultivation is marginal at best.

The more pernicious problem, however, is a lack of efficient, reliable and effective rural and agricultural infrastructure. Even if yields were improved and farmers were keen to invest in their own production, it is unlikely that Africa's cities would see any benefit. Roads are unreliable — the same journey from the field to the city could take hours or it could take days, depending on the state of the road — and much of rural Africa lacks electricity which impacts storage and irrigation.

Moving agricultural product across borders is even more unpredictable. Lorries are sitting at the border between South Africa and Zimbabwe (Africa's busiest border crossing) often idle for days, making the transportation of fresh fruit or produce a particularly risky proposition for farmers.

Attracting investment to Africa's rural areas has been difficult. Governments (quite rightly) see cities as catalysts to development and productivity and, as a result, tend to channel the vast majority of their infrastructure investment budgets towards urban areas. Politicians also tend to prefer urban investment, favoring projects that can bring the most (perceived) benefits to the most people.

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Simply put, infrastructure tends to unlock the value of other infrastructure, so investors would be best served thinking holistically about rural infrastructure investment.”

Private investors have been slow to fill the gap. Models for private investment into rural infrastructure in Africa have yet to emerge and there are, as yet, too few commercial farms to attract the attention of a more speculative investor or developer. Besides, most foreign investors are still trying to come to terms with doing business in Africa and, for now, would prefer to focus their attention on the cities where returns are more predictable and risks more manageable.

Everyone plays a role on the farm

Overcoming Africa's rural infrastructure deficit to unlock the continent's full potential will take determined action from government and the private sector.

Likely the greatest burden will fall on governments. Investment priorities and prioritization models will need to change to properly reflect the critical value that agriculture provides. This will require

governments to have a better understanding of the relationship between infrastructure, agriculture and productivity. With this information, governments will need to channel more of their precious resources towards a stronger balance of rural and urban infrastructure.

Government will also need to focus on encouraging private investment into Africa's agricultural sector and rural areas. Reducing regulatory complexity and improving contract certainty will certainly encourage some investment. But governments will likely also want to take a more interventionist approach through levers such as localization requirements on foreign direct investment and tax incentives.

The private sector will also need to play a role in overcoming Africa's rural infrastructure deficit. The returns on a single rural infrastructure asset may not be as rewarding as a similar investment in urban infrastructure right now, but significant potential exists to capture other value generators down the road. An investment into a new rural road, for example, may change the investment equation for the development of a new power plant or hospital in the same rural area. Simply put, infrastructure tends to unlock the value of other infrastructure, so investors would be best served thinking holistically about rural infrastructure investment.

Private sector players will also play an integral role in improving the agriculture value chain across the continent. From seed brokers and fertilizer producers through to grain warehouses and ports, much of the agricultural value chain rests in private sector hands. Many are already focused on growing their market share in Africa but more must be done to encourage new investment by foreign players and more established indigenous industries.

Planting the seeds of growth

Africa's promoters, investors and consumers have a lot to be excited about. Africa's economies, businesses and cities are ramping up for tremendous growth and opportunity. But fulfilling Africa's full potential will take more than investments into cities alone. It will require a balanced approach that unlocks Africa's agricultural potential at the same time as its economic potential.

Those that manage to achieve the right balance should enjoy more sustainable economic growth. Those that do not will likely suffer slower growth, higher costs and a widening divide between urban and rural populations. ■

1 Fact Sheet: The World Bank and Agriculture in Africa: <http://go.worldbank.org/GUJ8RVMRLO>

2 <http://www.economist.com/news/briefing/21694521-farms-africa-are-prospering-last-thanks-persistence-technology-and-decent>

A new era of asset delivery: Driving value in a complex world



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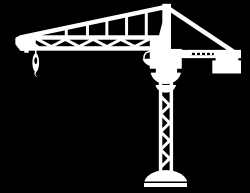
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Shareholder, lenders and taxpayers worldwide are expecting better management of their physical infrastructure over the life of the asset. Traditionally, building, operational performance, and rehabilitation and maintenance management have been treated as distinct silos. From organization, cost and value reporting through to managing stakeholder expectations, in many instances, this has driven poor life cycle decision making unpredictable consequences



and poor stakeholder value. As margins have been eroded, efficient capital allocation, optimizing operational performance and finding ways of extending the life of physical assets has become much more of a focus. And it has been warmly welcomed and adopted by executives and investors alike. Driving this rapid ascension is a growing recognition that not enough is being done to maximize the value of infrastructure assets and investments.

As this **Special Report on Asset Delivery** illustrates, the discipline of portfolio integrated management has become infinitely more mature and sophisticated over the past few years. With significant value to offer, we believe it is now time for infrastructure owners, operators and investors to get serious about their approach to how they optimize the life and performance of their infrastructure assets.

Around the world, demand for infrastructure capacity is on the rise and infrastructure budgets are struggling to keep up. But building new infrastructure is not the only way to bridge the gap. Infrastructure owners and operators should first start by improving the productivity of the assets they already have.

Optimizing the life cycle management of physical assets can deliver both topline and bottom-line benefits. Costs can be removed, downtime reduced and unexpected shutdowns avoided, while at the same time, helping drive growth and improving customer relationships. As our interview with Kevin Young at Australia's

Sydney Water illustrates (page 48), there is significant value to putting the customer at the heart of the asset delivery program.

Part of the challenge for infrastructure owners and operators is the sheer complexity of the task. But as projects become exponentially larger and more complex, the full value of asset delivery becomes apparent. Stephen Andrews' article on page 58 illustrates some of the challenges faced in creating predictability for complex capital projects, while Rajesh Ivaturi's article on India's largest power producer (page 54) demonstrates some of the challenges of integrating assets in a rapidly evolving world.

While the complexity of asset delivery may be increasing, the excuses for project delays due to poor project and asset management are rapidly disappearing. As Gary Webster points out in his article on page 56, asset owners and operators are increasingly facing pressure to improve the way they identify and manage their external risks throughout the asset's life cycle.

Of course, infrastructure assets do occasionally run into trouble and it is often

the job of engineers and asset managers to get projects back on track and improve efficiency. That is why — on page 50 — we spotlight Richard Price (the Director of Engineering with the UK's Southern Water) who has spent decades helping asset owners and sponsors keep their projects from going off the rails.

What is clear is that an integrated approach to asset delivery (and the value derived thereof) is set to increase significantly over the coming years. In his article on page 60, Mel Karam looks at some of the new approaches unlocked by data and analytics, the Internet of Things and Cloud computing. As his article illustrates, new opportunities to capture value from asset delivery are emerging almost daily.

This *Special Report on Asset Delivery* aims to introduce new ideas, catalyze debate and encourage action as we move into a new era of how organizations manage the development, delivery and operations of their infrastructure assets. We encourage you to contact your local KPMG office or any of the authors in this report to discuss these issues and ideas in more detail. ■

Restoring faith in major capital projects



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Governments and companies have a golden opportunity to dramatically reduce the high failure rate of projects, and build much-needed 21st century infrastructure without putting unnecessary strain on taxpayers or clients.

Late and over budget. Anyone working on large capital projects will probably be familiar with these four short words.

As a combination of economic and population growth fuels a boom in global infrastructure, both private and public sector project owners are desperate to slash the high rates of failure.

Climbing the Curve, KPMG's 2015 Global Construction Project Owner's Survey, reveals that more than half of respondents suffered one or more underperforming project in 2014–2015. In the previous 3 years, just 31 percent of projects came within 10 percent of budget, and a mere 25 percent came within 10 percent of their original deadlines.¹

If they want to meet shareholder and taxpayer expectations — and avoid taking a hit to their finances and their reputations — owners must be clear about risks, confident

in the way that the project is set up and run, and assured about outcomes.

All of this requires sound governance, risk management, partner selection, contracting and whole-life asset management.

Dispelling the myth of the 'black swan'

Projects that fall short of their targets, or fail completely, are rarely caused by 'force majeure' random events, otherwise known as 'black swans.' They are far more likely to be a result of controllable factors such as inadequate leadership, governance and reporting, poor planning, project and risk management, and a lack of appropriate resources.

It's impossible to overstate the value of experience and know-how when approaching a project. Some of today's mega-projects involve enormous scale and complexity, to a degree that few organizations have encountered before.

¹ *Climbing the curve: 2015 Global Construction Project Owners' Survey*, KPMG International, 2015.



Those ultimately accountable for projects — boards of directors of private companies, and Cabinet Committees within government — have to recognize the risks within projects and ensure that everything is in place to maximize the chances of success. This means focusing on four key areas:

1. Get your governance right

Realistically, senior executives cannot be expected to manage the day-to-day elements of a project and must cede responsibility to project management teams, while maintaining strong management controls and monitoring. The **lead sponsor** is a critical role, both to facilitate the project and integrate the project team within the owner's organization.

Good governance gives boards a clear line of sight over project issues, and provides them with the right information, in the right format, to make the right decisions at the right time. Transferring certain risks to contractors and sub-contractors can reduce overall project risk.

Many experienced practitioners preach the benefits of a **project charter**, which defines objectives and reporting, separates decision-making and responsibility, and empowers the project team with delegated authority.

A series of **'approval gates'** divide a major capital initiative into stages and provide an overall roadmap, clarifying what has been achieved and what is to come. The key executive decision-makers should not permit a project to progress unless it has met specific goals relating to regulatory requirements, stakeholder acceptance, construction and operations.

The **Project board** convenes regularly to go over monthly performance metrics. Not only should the board be composed of suitably qualified personnel; it should also, as needed, be supplemented by commercial and technical experts. For an additional level of comfort, a team of external specialists can carry out independent assurance on the project progress and governance.

2. Take a life cycle approach

Infrastructure assets are expected to last for decades, during which time there will,

inevitably, be operational, maintenance and repair expenses, and risks to performance. A **life cycle approach** ensures that any investment evaluation takes into account these ongoing costs and risks, as well as the upfront design and build charges.

'Warranties' can apply to engineering, procurement and construction (EPC) contracts and private-public partnerships (PPPs). In the former, warranties cover pieces of equipment for a relatively short period after completion. In the latter case, the entire asset performance is warranted for the life of the contract, with hefty financial penalties for under-performance; in effect transferring much of the risk to the private provider.

3. Be aware of commonly occurring issues

An ability to learn from both successes and mistakes is all part of developing a 'corporate memory' of good practice.

Boards may not fully appreciate the subtle trade-offs between conflicting objectives, particularly between cost and schedule. Nor do they necessarily understand the potential risks that could slow down a project or cause extra costs. **Project objectives** should, therefore, be aligned with the owner's business goals, and with those of any partners and suppliers, with contracts focusing on performance and output.

There tends to be a strong correlation between **advance planning** and project success. A comprehensive plan considers the needs of a full range of stakeholders, including shareholders, public interest groups, citizens, employees and unions. Key risks should be identified and monitored, with potential risk sharing with partners.

Contracts are absolutely critical, not just to strike a fair deal with suppliers and contractors, but to establish an agreed, transparent working relationship for the duration of the project. Collaboration between owners and bidders can smooth the path, aided by an independent fairness auditor.

Finally, the dedicated **project team** should have the right combination of commercial and technical expertise, to plan and negotiate issues that carry very significant financial implications.

4. Receive and act upon the right information

When a board has passed everyday control to the project team, it's important not to lose touch. By creating a mechanism for receiving regular, reliable information, leaders can assess progress and make important investment decisions. **Reports and monitoring** should be dynamic and forward-looking, with strategies and contingencies for addressing any risks or challenges.

The best systems use visual aids such as **dashboards** to compare actual performance and "earned value" against plan, as well as highlighting early warnings of problems.

Building a more predictable future

In the next 15 years, the world needs more than US\$60 trillion of global infrastructure investment² in energy, telecommunications, buildings, roads and bridges, ports, transportation systems and water/wastewater. If project owners wish to avoid nasty shocks for taxpayers and shareholders, not to mention reputational damage, then sound governance and executive management can bring greater clarity over project risks, predictability in monitoring, and certainty in outcomes.

Key questions

- Does your organization have a clear governance structure for managing capital projects?
- Do you take a whole-life cycle approach to investment appraisal?
- Are your project objectives aligned with the owner's business goals?
- How effective and consistent is your project reporting?

This article is a concise version of *Building on success; learning from failure, Governance and executive management of major, capital projects*. ■

Putting the customer at the heart of asset management

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In this article, we asked **Kevin Young, Managing Director of Australia's Sydney Water**, to provide his perspective on customer centricity, asset management and the changing demands on today's utility providers.

How do changes in customer behavior and preferences influence the way you manage your infrastructure asset?

When I first graduated in engineering a long time ago, the focus was all about infrastructure and construction. After this I made my career in the asset management of infrastructure, driving the best life cycle outcomes at agreed service levels. This drove tremendous change but on reflection, the service levels were set by the industry for customers because we believed that we knew better. In essence we had an engineering focused, paternalistic industry that had to change. And it has. The vision for our nations' water association in Australia is "customer driven — enriching life". We have entered the 'age of the customer' and it's an exciting and compelling time.

Customers today are more informed and more connected than they have ever been. Customers are time-poor, and want to interact with a business at a time and using a channel that is convenient to them.

Many of our customers are financially constrained. Their water bills compete with many other utility services' bills. Customers expect the services they get from Sydney Water to meet similar standards to other service providers they deal with.

So the biggest change for our business is to provide valued water services to our customers. That means products and services of the highest

quality and reliability at a price that is affordable and represents fair value. It also means having the confidence and trust of our customers.

We as an organization need to ensure we understand these changing customer expectations and needs. Sydney Water no longer sees itself as an organization that manages infrastructure assets only — we are a customer-focused business that needs to understand what our customers value and are willing to pay for. Our work, which is paid for by customers, must simply meet their needs in engagement, in responsiveness and in service delivered by our assets.

What does 'customer centricity' mean in the utilities space? How does it influence asset decisions and management?

Customer centricity means taking the asset out of the center of our business and replacing it with the customer. Being a 125-year old water utility built on solid engineering principles, that is no easy feat.

Customer centricity is about having the right people, processes and systems in place to deliver great outcomes for our customers. It's also about having the right amount of customer insight, and the ability to act upon it.

At the operational level it's about understanding the 'moments of truth' in the customer experience. Successful, customer-

centric organizations then focus on these moments of truth to deliver a great customer experience.

At the strategic decision making end of the business it's about integrating the 'voice of the customer' into decision making, and being able to make good decisions for future generations based on the customer needs and aspirations of today.

Over the last 12 months we have undertaken a major operating model review which led to a mandate to shift the entire organization to a customer centric model. This focus means a new organizational structure, value chain (starting with the customer) and new accountabilities and decision rights. The shift means great efficiencies which allow lower bills for customers but also allows the ability to invest in new areas to drive customer value.

Why should utilities be focused on becoming more customer centric?

More than a 'nice-to-have', being a customer focused business is a 'need-to-have' in this day and age.

Being a customer focused organization makes good commercial sense — and my call to action to the industry is the same call to action that I gave to my own business: We need to step-up and provide value to our customers in the products and services we provide, and at the best possible price.



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Sydney Water no longer sees itself as an organization that manages infrastructure assets only — we are a customer-focused business that needs to understand what our customers value and are willing to pay for. ”

Kevin Young

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We are living in a digital age where the rate of transformation is greater than it has ever been. Innovations in technology are not just impacting how organizations are run but also empowering customers to demand and expect more from service providers.

If we do not keep up with customer expectations around the value we provide then we will not continue to operate as a successful business — it's all about building customer trust and organizational resilience.

How do you balance customer demands/preferences against the objectives of the organization?

The core mission of our organization is to provide essential water services to our customers — which includes water and wastewater, and in some areas stormwater and recycled water. In doing so we have three key objectives — to protect public health, protect the environment, while operating a successful business.

When we make decisions, whether it be capital prioritization of sewer overflow infrastructure, treatment plant upgrades etc., it has to strike the right balance between meeting these three objectives, while keeping the customer at the heart of the decision making.

In customer experience design we balance customer demands/preferences against the objectives of the organization by asking ourselves three questions — Firstly do customers want it (value it)? Secondly, is it technically feasible? And finally does it make good commercial sense?

We appreciate that there are balances to be achieved. My performance agreement as Managing Director of Sydney Water has four major metrics that measure my success (and that of the organization). They are as follows:

- Customers' experience with Sydney Water
- Customers' level of trust with Sydney Water
- The culture of our organization moving to a highly constructive and collaborative environment
- The financial value of our business.

In your opinion, how will the need to monitor customer behavior change the way assets are managed in the future? How will technology improve or facilitate that relationship?

In the future we will need to be more proactive in how we manage our assets to deliver good customer outcomes. Technology will enable us to do this, but at the same time technology will empower customers to hold us to account.

Improvements in sensor technology, the internet of things, digital technology, advanced analytics and social media will all transform the way that we monitor customer behavior and manage our asset operations. We will need to be smarter with how we use data, and make decisions and act in near-to-real time.

The role that customers and the community will play in shaping the future direction of our business will continue to increase. We will see greater public participation in decision making that will be enabled by online platforms and social media.

In parallel with this, we are seeing our infrastructure becoming smart with lower cost sensors and mass connectivity. Our future dream is that we know about problems before our customers do.

What might other infrastructure sectors learn from Sydney Water's experience? What did you learn?

The message for other infrastructure sectors is that the shift to customer centricity is not an overnight one. It requires a continual and sustained process of change, with buy-in at every level of the organization — from front-line and back-office staff — right through to the Executive and Board.

I have learned a lot along the way, but the most important lesson is the role of people in making change happen. Strategy is all about change — finding new and better ways of doing business — and this means having the right culture in the business and the right people with the right mindset. ■



How to keep projects from going off the rails

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If you have a team that believes in itself, it is infectious. But if they believe at the start that they are going to fail, you can bet they probably will. ”

Richard Price

Director of Engineering and Construction,
UK's Southern Water
@SouthernWater



If there's a problem on a water project in Southern England, you can be sure that **Richard Price** knows about it. As the **Director of Engineering and Construction at the UK's Southern Water**, Richard oversees a portfolio of around 300 individual water and wastewater projects across Kent, Sussex, Hampshire and the Isle of Wight. And while his focus is on delivering the company's portfolio of asset investments, he also spends a lot of his time helping asset owners and sponsors to improve (and sometimes to repair) the assets under their control. Clearly, Richard knows a thing or two about spotting and recovering projects that have 'gone off the rails'.

A deeper view of success

With more than 20 years of hands-on engineering experience, Richard subscribes to the 'three pillars' of measuring project success: on time, on budget and at quality. But he also believes that project success depends on a fourth dimension: customer excellence.

"Customer excellence is so important in the delivery of projects," he noted. "People often think you can trade one off for another but I think that's completely wrong; in fact, the projects that meet the desired customer outcomes are often the ones that also have better cost records and better on-site quality."

Most readers of this publication have likely 'lived through' the equivalent of a sewer line or water mains repair in the past. So it goes without saying that minimizing the impact on customers is a key measure of success for Richard's team.

"It's critical that we engage with the community, explain what we are doing, how long we will be there and how we will minimize the disruption," he explained. "But just as important is to actually start when we say we are going to start and finish when we say we will finish — we need to plan our projects with clear customer outcomes in mind."

Understand the problem

With more than 300 individual projects on the go at any one time, Richard is keenly focused on ensuring that everyone involved in a project is working from a 'single view of the truth'. "If everyone is looking at the portfolio of projects through the same lens, we remove conflicting information and that allows us to then peel back the layers of the portfolio to really examine projects at a higher level of granularity," he added.

While understanding and agreeing on a single view of the data and clear outcomes for the project are incredibly important, Richard also stresses the value of identifying the root causes of issues right at the start. "Understanding the root cause of the issue is critical to assessing the potential interventions available to you," he added. "Really identifying that at the lowest level possible enables you to select the leanest intervention to deliver the performance that you require from an asset."

Knowing when to intervene

Working in the water sector, a large part of Richard's success depends on his ability to meet and manage regulatory requirements. The economic regulator — Ofwat — must approve the business plan; the Environment Agency sets environmental outcomes that must be met; and other important outcomes are set by the Drinking Water Inspectorate.

"We need to continuously marry our customer-facing outcomes with the needs of our regulators in terms of quality and environmental impact and then align that view to the bottom-up needs of our asset base," he explained. "It's that process that really tells us where we need to intervene either operationally or through an engineering and construction project to improve our performance."

An appropriate response

With the firm conviction that keeping projects 'on the rails' is easier than fixing projects that have jumped the tracks, Richard focuses on implementing a series of smart checkpoints into

the project life cycle, from project scoping and feasibility through to delivery and maintenance.

"We don't want any projects to simply move through inappropriately on a 'light touch' basis," he noted. "You always need to make sure that you have appropriate challenge on key decisions and the right level of rigor has been put into ensuring that the decision aligns to the root cause analysis or customer outcome."

To ensure the right options are being considered, Richard's team also takes a 'total expenditure' approach that prioritizes the most efficient interventions to achieve the desired outcome or performance improvement. "We're always looking at both the way the asset is operated and the available capital intervention options when we make our decisions."

Set up for success

Richard notes the importance of leadership and culture in creating a flexible and results-oriented team. "The team needs to truly believe they can deliver the project on time and to budget," he said. "If you have a team that believes in itself, it is infectious. But if they believe at the start that they are going to fail, you can bet they probably will."

Leadership is also critical to ensuring that everyone on the team is pulling in the same direction and collaborating on the delivery mechanism. "You need to change the muscle memory of those people in the team who may have operated in different environments for many years or who may be unwilling to break some of the paradigms of the past," he added.

Ultimately, Richard believes that keeping projects 'on the rails' requires asset owners and project managers to follow some basic principles: understand the outcomes you are trying to achieve; define the project scope well; identify the underlying root causes of your issues; apply strong controls; and have check-points throughout the project life cycle. "There can be unexpected events that can drive a well-planned project off the rails, but do these things well and you should find a clear path to success," he added. ■

Out of the basement: Enhancing asset management in the public sector



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A sset management is moving up the public sector agenda and attracting the attention of politicians and citizens alike. In part, this is because people want to know they are getting the best value possible from their infrastructure and their taxes. At the same time, the introduction of the ISO55000 standards for asset management have provided clearer guidance to help private and public sector organizations enhance their asset management programs.

Recently, **Ross Homeniuk, KPMG in Canada**, sat down with **Bradley Leeman, Director, Infrastructure & Funding Strategies at the City of Edmonton in Alberta, Canada**, to talk about the evolution of asset management in the public sector, the impact of the ISO standards and the rising awareness of the need for improved asset management.

Ross Homeniuk (RH): While asset management was always an important operational discipline, it seems that the

function has become a real priority for public sector organizations over the past few years. Do you get the impression that politicians and finance departments are now more focused on asset management and the value they get from their infrastructure?

Bradley Leeman (BL): Absolutely. Asset management in the public sector has traditionally been done in dark basements by public works types and operators. But over the past few years it has really come into the public discourse — politicians and the public really care about their infrastructure and want to be sure they are getting value for their investments and that means a focus on asset management.

RH: I think the public sector has also become much more sophisticated in their approach to asset management. It's become less about the nuts and bolts — though those are certainly important — and more about whether the asset is being managed appropriately to deliver the service that is required.

BL: Right. And so at the City of Edmonton, we think about our assets from a corporate perspective rather than on a departmental basis. We think about what our mission and vision is and how these assets are helping us fulfil that mission. It's all about thinking holistically about what you are trying to achieve and how you can best manage your assets to do that.

RH: I think it's fair to say that, generally speaking, the public sector tends to lag behind the private sector in terms of the rigor placed behind asset management. And in large part, that is because the private sector has a clear financial return on investment they are expecting to

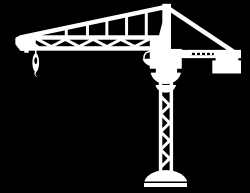
achieve which greatly influences the way they manage their asset.

BL: I'd argue that the public sector also wants to achieve pretty clear returns on their investments but the 'value' is sometimes a bit different. To the public, a road is worth more than the actual cost of its installation and maintenance; it's a path to a hospital, to work, to pleasure and parklands — even to City Hall — so asset management can't just be about getting the best financial returns. You really need to think about what the 'value' of that asset is.

RH: The introduction of the ISO55000 standards for asset management have certainly drawn attention to the need for more rigorous asset management capabilities. But I think people need to recognize that it's not a roadmap to 'good' asset management but rather a way to establish alignment between organizational goals and objectives on the one hand, and the practices and approaches you take to managing your assets on the other.

BL: I think of ISO55000 as something that helps define the 'what' and the 'why' of asset management but not the 'how'. If all you had was an ISO55000 document and you knew nothing about asset management, you'd probably end up with a pretty good management structure and lots of documents and policy. But you wouldn't have really operationalized anything. There are other documents — like the International Infrastructure Management Manual — that deal with the 'how' and these need to be viewed in concert.

RH: The ISO is really intended to be quite broad — to work in any type of organization — because it focuses on



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I think one of our biggest challenges is communicating the benefits of asset management to help stakeholders understand what we are doing and why we are doing it. ”

Bradley Leeman

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high-level alignment whereas the 'how' really needs to be quite specific. The IIMM certainly helps in areas categorized as public infrastructure — roads, parks, sewers, water and so on — but there are other standards out there that help with the 'how' in other areas like oil and gas, logistics or energy generation.

BL: And I would argue that the approach would vary depending on the size of your organization and what you are trying to achieve. A small town of 10,000 people probably is less interested in the 'why' and 'what' and more focused on the 'how'. The ISO really helps with ensuring alignment across large organizations and in securing funding for an asset management program, but when it's just three people in the organization you are probably focused on just getting it done.

RH: Many of our public sector clients are talking about becoming ISO compliant but few seem overly-focused on securing their ISO certification. Are the requirements of ISO certification too onerous or difficult to achieve in the public sector?

BL: Not at all. But I do think that some people are wary about the effort that goes into gaining — and then maintaining — an ISO certification. To be honest, I don't try to encourage people to get certified. What I encourage them to do is read the statement, think about how it can apply to their organization and do what they can to embed the principles into their current asset management program. Don't be afraid of doing ISO55000 because of the certification; just take that off the table.

RH: I'd like to come back to your point about the public and politicians becoming more aware of the relationship between their physical infrastructure, the associated services that are being delivered and the

cost of asset management. Do you think there is now a good appreciation for the discipline of asset management in the public sector?

BL: The public is certainly more aware of their infrastructure but we still have a long way to go before they really understand what it takes to look after these assets. In fact, I think one of our biggest challenges is communicating the benefits of asset management to help stakeholders understand what we are doing and why we are doing it. Not just so that we are being transparent with our investments, but also because the asset management debate can sometimes become quite emotional when people think you are changing something about their community assets.

RH: The City of Edmonton has certainly managed to raise awareness of the value of good asset management. What is your advice to your colleagues in other jurisdictions who may not yet have the same visibility?

BL: More often than not what you find in the public sector is one or two individuals working away and not getting much attention. But then all of a sudden it clicks in the minds of management and you go from being a lone wolf to instead leading the pack. The point is that it's not always a high-profile position and it doesn't always get the attention it deserves, but be patient: the journey is worth the trouble. ■



Integrating assets in a rapidly evolving world

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You need to look at your long-term road map and then think about how you execute that in annual cycles because the environment is changing very quickly. ”



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As infrastructure owners and operators start to shift their view from managing individual assets to instead focus on balancing a portfolio of inter-connected assets, many are struggling to create an integrated approach that spans strategy through to execution. And nowhere is this challenge more difficult than in the electricity sector where rapid technological shifts and evolving policy requirements are heavily influencing the asset mix.

For India's largest power producer — NTPC — integrating asset planning and management is not just critical for the company's future success; it is also vital for India's future growth and development.

Maximizing the value and performance of a single asset can be complicated; integrating the management of dozens of different assets can be overwhelming. And the problem compounds as the types of assets diversify (consider the complexity of managing a fleet of same-model buses, for example, versus managing an eclectic fleet of buses, cars, trains and ships).

In the power sector, the challenge is particularly acute. For one, new technologies such as solar and wind are rapidly evolving and must be integrated into an existing system that is largely designed for older technologies such as coal-fired plants. The sector is also highly influenced by regulatory and policy requirements that often dictate the types of assets and mix of generation capacity that can be developed.

Diversifying the asset mix

For large, diversified power companies like NTPC in India, the need to integrate asset management and planning across their various assets is clear. The company already operates 18 coal-based stations (either directly or through Joint Ventures), 7 gas-based stations and one hydro-based station. But by 2032, the plan is to diversify the fuel mix to about 56 percent coal, 16 percent gas and 28 percent from non-carbon generation sources such as nuclear, wind and solar.

"We are looking at what our goals and optimal fuel mix should be 10 to 15 years out, knowing that we will need to integrate various technologies in terms of coal, gas, solar, wind and nuclear to meet not only our corporate objectives but also the needs of the country as a whole," noted Mohit Bhargava,

General Manager with NTPC. "But we also recognize that India is currently experiencing significant power shortages and so, we are also looking to rapidly add capacity to the existing network."

Integrating technologies

Ensuring a sustained and secure flow of power capacity across various technologies will also be a significant challenge for NTPC going forward as intermittent sources such as wind and solar are brought into the mix.

"When we think about building a large solar power station, for example, we also need to develop an equal amount of coal-fired capacity to ensure we can provide power 24/7," noted Mr. Bhargava. "The cost of each technology is certainly a factor, but we also need to think about how we integrate new sources into the grid at the right time and sequencing to keep power flowing and to meet the country's growing demand."

Managing constant disruption

Recognizing that some technologies — particularly solar, wind and electricity storage — continue to rapidly evolve, NTPC needs to balance the company's optimal long-term asset mix against the realities of a constantly changing cost, capabilities and technology environment.

"You need to look at your long-term road map and then think about how you execute that in annual cycles because the environment is changing very quickly," he noted. "Just 5 years ago, the tariff for solar power in India was around 17 rupees per kilowatt hour and today it has fallen to just over 4 rupees — that is certainly great for the country but it also

influences where we invest and how we structure our portfolio of assets going forward."

Learning together

While Mr. Bhargava and NTPC are creating a uniquely Indian approach to solving the country's capacity shortages and meeting their renewables targets, he notes that the organization benefits from studying experiences in other markets that are also struggling with similar issues.

"We are looking at places like Germany, China and the US to find out how other countries are tackling this problem and — as much as possible — integrating their approaches and their technologies into our strategy," added Mr. Bhargava. "But I don't think anyone has come up with a perfect approach to integrating new technologies into the mix so I suspect we are all learning together."

Guided by a higher objective

Mr. Bhargava recognizes that the long-term vision for the company and for the country is to deliver a low-cost, low-carbon and secure source of power to drive India's development. And that objective, in turn, helps guide the organization's asset management and capital investment program.

"There are still a large number of people in India with no access to energy and the government has set a goal of connecting the entire country with affordable power by 2019," he noted. "The next decade will be an extremely exciting one for India and particularly the power sector; what is clear is that the opportunity and the complexity will be tremendous in the years ahead." ■

No more excuses:

How to stop project delays before they start



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It is often surprising that project owners blame unforeseeable events when they face significant delays and cost overruns. My experience suggests that around 9 out of 10 project delays could be avoided if project owners were to pay better attention to the 'external risks' throughout the lifespan of their project.



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My experience suggests that very few project owners put any rigor at all into creating a formal program to monitor and manage external risks.”

Given the enormous amounts of time, resources and capital going into these projects, I believe infrastructure owners need to be placing as much focus on managing externalities as corporations do when looking at (and managing) external trends that can affect their bottom line.

The fallacy of unavoidable delays

Large capital projects and ‘megaprojects’ are notoriously difficult and complex to develop and deliver. So it is, perhaps, not surprising that a large number of these projects suffer from delays. After all, most of these projects tend to have 10- to 15-year timespans between the start of design and the delivery of the asset; surely it’s inevitable that initial timelines will slip somewhat over that time.

Yet the reality is that most projects fail, not because of technical mistakes or risks, but rather because an external risk (or a basket of inter-related external risks) was not properly monitored and managed throughout the life cycle of the project.

Don’t just identify external risks; manage them

Experience suggests that most project owners do a fairly good job at identifying and quantifying external risks at the start of a project. Indeed, when initially ‘scoping’ out a new capital project, project sponsors, promoters and investors are often meticulous about detailing the potential technical and many of the external risks that could impact their initiatives.

The problem is that all of this work tends to happen long before the ‘unknowns’ are known. Financial and environmental plans have yet to be reviewed by the regulators; land rights and environmental approvals have yet to be secured; and the longer-term impacts of economic or social change have yet to become clear. Simply put, almost everything will change between the time that the project is initially scoped and the time it is delivered.

Most project owners put little effort into reviewing and monitoring these external risks once the project is in flight. In fact, experience suggests that very few project owners put any rigor at all into creating a formal program to monitor and manage external

risks during implementation. And yet they seem surprised when the project suddenly suffers delays due to some ‘unexpected’ (yet wholly predictable) external factor.

Put some rigor to it

Granted, monitoring and managing the wide variety of potential external risks that could impact a major project isn’t easy. There is, to date, no slick software package or innovative tool that brings together all of the risks into one easy-to-view dashboard. Each potential external risk needs to be reviewed individually and then integrated at a strategic level to assess the potential interdependencies. Regular monitoring and assessment are necessary to avoid the catastrophic outcomes we all too often read about.

Part of the challenge is that these external events can be triggered by a wide variety of events or trends such as changing stakeholder requirements, shifting economic and political realities, climate, industrial and market pressures, regulatory environment and demographic trends.

Capabilities are also a potential challenge: many leaders of major capital projects are gifted with technical or construction management, but often do not have the broader experience to deal with the complexities of the complete project environment and understand how they can impact the end result. And because major projects span such a long time frame, staff and leadership tend to change, meaning that the thinking of the past is often lost and there is a general breakdown in governance.

How to stop delays before they start

Project owners are almost always equipped with the right focus and ability to monitor technical risks in detail. The big question is why they aren’t applying this discipline and rigor to their external risks in the same way.

To start, project owners and sponsors should be working at the board and executive level to ensure that project leaders understand the complexity of the project environment and have the ability to provide strategic leadership throughout the project life cycle.

Technical brilliance requires intense focus which can limit the ability of a project leader

to scan the horizon for broader trends that will affect a project. This can lead to what can be termed strategic blind spots which, if not addressed, can lead to dire outcomes.

Project owners should also be thinking carefully about how the external life cycle risks are passed from one stage to another, whether it is planning to design, design to construction, or construction into operations. All too often, projects are handed over without the benefit of knowing the thought process that underpinned the decisions or the assumptions that informed the risk assessments. More must be done to ensure this transition is effective and past knowledge and judgment are brought to bear on later stages of development.

Owners could also be doing more to establish formal governance and controls over the management of external risks. In some cases, this may involve adding external risks to the project risk register or Enterprise Risk Management process to ensure that they are being reviewed at the appropriate frequency and depth. It should also involve setting the right checkpoints and conducting robust reviews.

But ultimately, even with all the right tools and controls in place, much depends on the experience and view of the project leaders. Those who have delivered significant and complex projects in the past tend to have a stronger appreciation for the external risks: as the saying goes, “once bitten, twice shy.” The problem is that these types of leaders are hard to come by in today’s market: most are either now retiring or in fierce demand.

No more excuses

Investors and owners are starting to recognize the importance of a robust approach to managing external risks throughout the life cycle of a major capital project. In the public sector in particular, watchdogs and government auditors are taking a keen interest in how project owners and leaders are identifying, monitoring and managing external risks.

With few exceptions, there should be little need for excuses for project delays. It’s time for infrastructure owners and leaders to start giving their external risks the attention they deserve. ■



Ensuring predictability in complex capital projects

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Capital projects must always be delivered to exacting standards. But none more so than those that are developed to produce lifesaving pharmaceuticals and biologics. For life science manufacturers like Bristol-Myers Squibb (BMS), ensuring predictability around capital project delivery is key, not only to the organization's future success but also to the safety of patient lives.



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The fewer people that you have to go to when you need to make decisions when things change, the faster you are going to be able to move.”

Michael Furlong

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There are few capital projects as complicated or as sensitive as building a new biologics facility. For one, the feed material for the operational facility will consist of living cells, which makes process control critical. Contamination is a constant risk so control systems, automated systems, data recordings and data histories must all be contained within a closed process. And, at the end of the day, the final product will be injected into humans — often to help treat a serious disease — making every decision a potential life-or-death scenario.

For Bristol-Myers Squibb (BMS), one of the world's leading biopharmaceutical companies, the need to build a new biologics facility was clear. The company has enjoyed significant growth in its range of products (introducing 12 new medicines in the past 7 years alone) and — while they could rely on their existing facilities in the US to meet existing product requirements — the organization would need to add to its in-house network to meet demand for the new biologics it had in development.

Not your average development

With a budget of close to US\$1 billion and their eyes set on a location in Cruiserath, Ireland, BMS is now in the early stages of construction on their new large-scale cell culture manufacturing facility which will be developed alongside a new lab and office complex. The facility is expected to be operational by mid-2018.

According to Michael Furlong, BMS's Project Director for the construction program, capital projects of this size and complexity are rare. “The last large-scale biologics facility we built was in the US in 2005,” he noted. “We've developed a number of smaller lab complexes and development complexes over the past decade but something of this complexity is few and far between.”

Much of the complexity comes down the execution and delivery to exacting standards required in the biologics manufacturing process. The new facility will serve markets

around the world and therefore must comply with standards set by regulators in the US, Europe, Japan and other major markets.

At the same time, the production of biologics requires highly sterile environments and closed processes. “The plant will have more than 70 kilometers of piping, 60 percent of which is sterile, so there is a good deal of complexity that has to be controlled within very tight parameters on a day-to-day basis,” noted Mr. Furlong.

Securing predictability

Facing a massively complex and somewhat rare undertaking, how is Mr. Furlong and the BMS team driving greater predictability in their project? According to Mr. Furlong, the first — and possibly most important step — was to ensure that the project was well understood and had the undivided support of the executive team.

“We spent a good deal of time making sure that everybody knew what we were building, why we were building it and the options for where it should be placed,” he noted. “We knew we needed to invest that time to make sure there would be no major changes once we went further into design.”

The team also focused on determining the stakeholders that would be allowed to influence decisions throughout the design, construction and hand-over phases. “The fewer people that you have to go to when you need to make decisions when things change, the faster you are going to be able to move,” he added.

According to Mr. Furlong, the third key element that needed to be in place at the outset was a full understanding of the risks and their influence on a variety of factors including costs, schedules and compliance requirements. “You need to factor in what you think you need plus an appropriate layer to reflect the known risks — not to sandbag the budget — but to ensure that you can react to challenges appropriately without putting the project in jeopardy.”

Integrating operations

While BMS is currently just starting the construction phase, the team clearly recognizes that the ultimate objective is to hand over a fully-operational, safe and efficient facility to an operations team by mid-2018. To ensure that the facility will operate optimally, Mr. Furlong's team is investing significant time into working closely with the various functional areas that will operate the plant.

“We are already hiring and staffing the operational teams that will take this facility over and they are helping us with important elements such as factory acceptance testing on newly installed equipment and facility infrastructure layout and design,” he noted. “It's like a relay race: you really need the next runner to be pacing alongside you — moving at the same speed — if you want to hand over the baton efficiently.”

The right people with the right incentive

Mr. Furlong credited his team for much of the project's success and noted the importance of hiring the best possible people for key positions. In particular, the team focused on securing a top-notch Project Engineering Director, Automation IT Director and Head of Process Engineering. “We wanted people who didn't just have the right experience, but also the right outlook and a solutions-focus,” he noted. “They had to want to work on something really important.”

At the same time, Mr. Furlong emphasizes the importance of having a strong partnership with the architectural engineering and construction management firms. While BMS broke the project out into two separate RFPs, it was Jacobs Engineering Group that was awarded both contracts.

“We have great alignment with our EPCM contractor and maintain a shared belief that we both need to succeed in order to make this project work,” he added. “Both the Jacobs team and the BMS team are fully aware of what we are trying to achieve here — we are making it possible for people to receive life-saving and life-changing medications for decades to come.” ■

Why data is the asset to manage



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Asset managers are no strangers to data. Indeed, data and analytics has always been at the heart of any asset management program. Data is the lifeblood of our decision-making process, guiding everything from capital investments through to maintenance schedules. And significant emphasis is placed on the importance of data within the new global ISO5500 standards on asset management.

Yet, recently, the 'value' of data has changed. New technologies, sophisticated

analytics capabilities and cognitive computing have fundamentally altered the relationship between data and asset management. Now, it's up to infrastructure owners and operators to adopt these new ideas to drive unprecedented efficiency and customer service from their assets.

A massive data dividend

Infrastructure owners and asset managers are rapidly recognizing the massive benefits that are now becoming available through data and



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Infrastructure providers are also quickly gaining the skills and capabilities required to turn their data into insights and their insights into competitive advantage. ”

Spotlight



analytics (D&A). Toll road operators are already using sophisticated D&A tools to monitor capacity utilization in real-time and then take corrective action to avoid bottlenecks. Shipping operators are using D&A to predict the optimal shipping route based on a broad basket of information including weather patterns, ocean currents and port availability. Water companies are using D&A to accurately predict demand, allowing them to pump only the quantity of water needed for that 24-hour period.

Where D&A is offering particular benefits for infrastructure providers is on the maintenance and operations side as operators leverage data from sensors to move from ‘scheduled maintenance’ to ‘on-demand maintenance’. So instead of bringing a ship into dry dock for 2 weeks each year for annual maintenance, shipping companies can now see all of a ship’s maintenance requirements in real-time and decide on the proper corrective action.

Consider the benefits: hydro companies can keep their turbines operating at optimal capacity for as long as possible; train operators can replace rolling stock and parts based on need rather than on a ‘best guess’ schedule; and across all sectors, safety can be vastly improved by enabling real-time and continuous monitoring of critical components and processes.

Data and analytics is also being used by infrastructure owners and operators to improve customer service and — in some cases — even link the customer service issue to a particular performance issue at a specific asset. This allows a direct link between customer contact, the customer issue and the asset causing the problem, providing the insight required to help identify and then eradicate the root cause.

The future is here

All signs suggest that D&A will become increasingly pervasive in the infrastructure sector. In part, this is because the cost of D&A tools and systems is dropping quickly. High-quality, sophisticated sensors can be purchased for less than one US dollar. Mind-blowing processing capacity can be acquired on demand and at scalable quantities. Terabytes of data storage can be found for pennies in the cloud. And as costs drop, the return on the investment for asset managers grows exponentially.

At the same time, the tools and algorithms that underpin D&A are becoming much more sophisticated. Machine learning and Artificial

Intelligence (AI) technologies are allowing computers to learn on their own, using decades of data to essentially isolate the best response based on certain variables; basically learning from our mistakes. And the ‘black boxes’ aren’t just getting smarter, they are also becoming more user-friendly with new visualization technologies, easy-to-use graphic interfaces and clean and clear dashboards.

Infrastructure providers are also quickly gaining the skills and capabilities required to turn their data into insights and their insights into competitive advantage. Building from their existing internal capabilities, many infrastructure operators are now starting to take a more formalized approach to identifying and developing the new skills and capabilities required in this technology-enabled environment. And, as they gain more experience and confidence, these capabilities are spreading across the organization.

Business-led, technology-enabled

Be warned: no value comes from doing D&A for the sake of doing D&A. And nobody ever won the D&A ‘race’ by spending the most money. Getting value from D&A takes time, patience and lots of hard work. And it takes a clear goal in mind.

It starts with understanding the specific problems you are trying to solve. Maybe you are trying to reduce operating costs. Or maybe you want to increase capacity. Or you may want to improve the customer experience. The point is to isolate the problem you are trying to solve or the question you are trying to answer.

The next step is to identify the data that is needed to provide that answer or insight. Significant value can be harnessed from existing operational and performance data, but very often additional insights can be generated by overlaying external data such as weather patterns, supplier data or even social media streams. The challenge here is to create the right controls and governance to ensure that the data being used is fresh, reliable and accurate.

With a firm understanding of the business problem you are trying to solve and confidence in the data at your disposal, it is now time to think about technology. And the reality is that there is a wide variety of solutions, tools and technologies to choose from. Infrastructure

asset owners will likely need to integrate a combination of solutions — hardware and software — depending on a variety of factors such as the outcome they are trying to achieve, the types of assets they are managing, the sophistication of their management team and their cost restrictions.

A journey to maturity

The big secret to success in D&A is to not get overwhelmed. There is a broadly recognized maturity curve for D&A that infrastructure owners and asset managers will need to evolve through. It starts with gaining capabilities and confidence with what is called ‘descriptive’ analytics — essentially the reporting of events that happened in the past. Once that has been mastered, organizations tend to move on to ‘diagnostic’ analytics which focuses on understanding the root cause of the event.

Today, many of the more mature industries (such as retailers and technology providers) are using ‘predictive’ analytics which allows executives to essentially predict — to a high degree of accuracy — what is likely to happen in the future. The highest level of maturity (that we yet know of) is called ‘prescriptive’ analytics and goes one step further to provide the user with recommendations on the actions that should be taken.

As with any maturity curve, it’s nearly impossible to skip a step. Some can certainly be accelerated, but the reality is that infrastructure owners and asset managers will need to go through each level of maturity in sequence in order to reap the full benefits of D&A. In fact, we believe that each step should be embraced and exploited rather than rushed and forgotten.

Time to act

Data and analytics is not a fad or the product of hype. It is an evolutionary capability that holds the power to unlock massive benefits and unprecedented asset performance for infrastructure owners and users alike. But securing these benefits will require significant effort, investment and vision.

Being able to make good decisions based on accurate data is critical to managing infrastructure assets efficiently and effectively. And being able to harness the right data at the right time to answer the right question will be key to driving value. The tools, data and technology are all available; now it is time to act. ■

Hyperloop at hyper-speed: Disrupting the transportation sector



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When Elon Musk — founder of Tesla Motors, PayPal and SpaceX — posted his idea for a new 'fifth mode of transport' in 2013, the transportation sector took note. Musk had already fundamentally disrupted the payments, automotive and space sectors; nobody doubted that his idea could potentially revolutionize the way the world views transportation.

Musk's expectations for the new system were almost unbelievable; his system would offer immunity from weather, cars that never crash, average speeds twice that of a typical jet, low power requirements and the ability to run 24-hour operations. "The basic concepts are very simple and it's really a very elegant architecture that creates massive advantages over existing transportation methods," boasts Rob Lloyd, CEO of Hyperloop One, a company founded expressly to bring Musk's idea into reality.

What exactly is Hyperloop?

The basic concept behind Hyperloop (as Musk named the technology) is rather simple. Low-pressure tubes to remove air-drag significantly allow pressurized capsules to dart great distances at unprecedented speeds using electric motors and air compressors.

Hyperloop One's approach is based on four basic concepts. The first is that the system is housed in an enclosed, low-pressure environment which removes air resistance and, in doing so, reduces the energy required to move an object at high speeds. The second concept is that the system is using magnetic levitation, thereby reducing the friction almost entirely and resulting in less wear and tear and maintenance. The third concept is that it uses a linear synchronous motor to propel the vehicles in the tube and the final concept is that smaller 'pods' are used to transport people or freight in a 'packetized' and on-demand fashion.

"We will move people and goods at very high speeds, with very little energy, no noise pollution and a very small footprint, all of which gives us something that is ultimately faster, safer, cheaper and greener than other current transportation alternatives," argues Lloyd.

Believe the hype

Since Musk's announcement, the Hyperloop concept has been heavy on hype. But if Lloyd's team is successful, the hype will be extremely well-founded. His group has already proven that the technology is capable of moving people or objects at speeds of up to 1,100 kilometers per hour, crossing from San Francisco to Los Angeles in just 35 minutes. That's 15 minutes to go from Manchester to London or from New York to Boston.

"If it took just 15 minutes to get to a major city 300 kilometers away, how would that change the way you interact with that city?" he asks. "When you start to look at transportation based on time rather than distance, you change everything — where you live, where you work, how you manage logistics, how cargo is priced — it will be a truly amazing shift for society."

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When you start to look at transportation based on time rather than distance, you change everything — where you live, where you work, how you manage logistics, how cargo is priced — it will be a truly amazing shift for society.”

Rob Lloyd

CEO, Hyperloop One
@Rob_Lloyd



While some in the transportation sector may view Hyperloop as a potential disruptor, Lloyd argues that the technology will actually improve the efficiency of existing infrastructure. Imagine, for example, if cargo coming into ports could immediately be shunted to an inland customs clearance facility where land costs are lower and processes more efficient. Or if airports in the same region could move passengers from one airport to the next as if they were moving between terminals.

“Hyperloop is a fifth mode of transport — it doesn’t replace other existing transportation modes, it connects them,” he argues. “We look at it as a new backbone that enables us to connect other infrastructure and transportation systems together in a very cost effective and environmental way.”

The other reason that Hyperloop could be a ‘game changer’ is that — unlike trains and planes that move between terminals — Hyperloop is envisioned as a ‘packetized’ system that goes directly to its intended destination. “The idea is that we move smaller units of cargo and passengers point to point and that’s what is going to make this so disruptive in the end.”

An idea whose time has come

While there were initially many sceptics, the work being conducted by Lloyd’s team and others has turned many into believers. “Investors love it,” coos Lloyd. “And regardless of how hard the technologists try to invalidate the engineering, they can’t — the engineering is certain.”

The company has already raised more than US\$100 million in funding from investors eager to see the technology move from concept to full-scale prototype. And they have had expressions of interest from markets in the Middle East, from Russia and from Singapore where the value of being able to ‘leapfrog’ the mature markets with a new technology can be particularly alluring.

The Hyperloop concept is also gaining significant support from the public who seem eager for an alternative to current transportation options. “Traffic is getting worse, airports are at overcapacity, shipping is slow and hard on the environment; it feels like the world is cheering for something new and we believe that Hyperloop is the thing they are cheering for,” says Lloyd, who had served as President of Cisco Systems prior to joining Hyperloop One.

Creating the right environment

Of course, introducing an entirely new form of transportation into a world ruled by regulation and constrained by incumbent thinking will not be an easy task. “We can’t be regulated by existing regulations that were designed for technologies that are now more than a century old,” argues Lloyd. “I think regulators have both a challenge and an opportunity to create new rules that properly encourage new and emerging modes of transportation.”

Lloyd also acknowledges the cost challenges associated with developing and scaling up a completely new technology with no existing supply chain or ecosystem. But this also presents an opportunity for the group to develop the technology with a systems-based approach rather than a component-based approach. “A systems-based approach will help us reduce the overall cost and will allow us to better integrate new software and hardware more rapidly which is pretty exciting for bureaucrats.”

Deploying at hyper-speed

Maybe the most amazing thing about Hyperloop is the speed at which the technology is being developed and tested. Lloyd’s organization is already running tests at their purpose-built Propulsion Open Air Test facility in North Las Vegas and expect to have their full-scale Development Loop Test up and running by 2017. “People think it will take a decade or more to operationalize an idea like this, but we’ll have the first



industrial prototypes — moving people and freight — in 2020 and 2021.”

Lloyd credits the organization’s success and speed to market to the skills, tenacity and experience of his team. Not surprisingly, his organization attracts some of the world’s top talent who are looking for opportunities to make a real difference in the world around them. On average, the organization receives upwards of 500 applications for every job they post.

“We’re hiring some of the world’s brightest minds — people who know how to come up with innovative ideas and have the experience to implement them,” notes Lloyd. “We’re creating a culture of builders rather than theoretical designers.”

Technology is also playing a key role in driving Hyperloop’s rapid development and deployment. Under a blue tent at the company’s Nevada test site, the organization is currently running what it calls ‘Robot University’ where AI-enabled robots learn unique welding techniques and processes from the organization’s “Master Welder”. Once they have learned their trade, they’ll be brought out to the desert to start working on the new prototype.

“We are finding ways to do things differently, to design, test and build much faster than anyone would have anticipated,” Lloyd notes. “Linear development cycles may have made sense when engineers were improving old technologies, but we need to move much faster and learn lessons much more rapidly than before.”

Get ready to think differently

While some questions may still remain about the application and cost of the new technology, what is already very clear is that Hyperloop is more than just a radical new concept. It is a new way of thinking about distance and travel; it is a new approach to transportation; and it is a demonstration that new ideas can be rapidly tested and deployed when the right minds and effort are put behind it. ■



UPDATE:

The G20's Global Infrastructure Hub



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It has been just over one year since G20 leaders met in Brisbane, Australia to establish the Global Infrastructure Hub. To find out how the initiative is shaping up and what it hopes to achieve through its mandate, **James Stewart, KPMG's Global Infrastructure Chairman**, sat down with **Chris Heathcote, Chief Executive Officer of the Global Infrastructure Hub in Australia**.

James Stewart (JS): *The G20 meeting in Australia made it clear that governments were getting serious about tackling the global infrastructure deficit. How did that focus lead to the establishment of a Global Infrastructure — or GI — Hub?*

Chris Heathcote (CH): I think the G20 recognized that infrastructure is one of the best available levers to encourage economic growth. But they also recognized that — while there was a wall of money available for infrastructure finance and a wall of projects that needed money — the two were not

matching up. The members of the G20 saw an opportunity to help bridge that gap by helping governments around the world create the right environment and structures to attract private investment and the GI Hub was born to facilitate that.

JS: *That is a massive undertaking. How is the GI Hub expected to achieve that?*

CH: It certainly is. And we are not as large an operation as the World Bank or other multilateral initiatives with similar objectives. But our role is to focus on breaking down the barriers to entry for infrastructure players, to help them

enter new markets and be more effective in those markets. And that means we need to help build capacity in the markets with the greatest need for private investment.

JS: So establishing best practices and making them available to governments?

CH: Yes, but we need to be very mindful of the particular circumstance in the country. There's no point giving Malaysia the UK's risk matrix and telling them to go take it to a bank; that's just not going to work. But there is plenty of really good data available about the process of procuring infrastructure and of building infrastructure — studies of production costs, timelines and outcomes, for example — and this type of information can certainly help governments understand how to improve their infrastructure procurement.

JS: Your mandate includes working to address data gaps. What are some of these data gaps and how do they impact infrastructure investment?

CH: I think there are lots of different data gaps that are important. One that could make a huge difference is if we were able to do 'in-flight' reassessments of government cost benefit analyses on projects. Then you would be able to start a positive feedback loop that could help governments improve the way they conduct their cost benefit analysis in order to better understand real project benefits.

Another data gap is around the operational outcomes of a piece of infrastructure. We know a lot about how to procure and build it, but we don't really have a lot of data on how it then performs. Collecting that data would be a significant step towards turning infrastructure into a formal asset class that attracts institutional investors.

JS: What will the GI Hub realistically be able to achieve within your 3-year mandate?

CH: We have a specific target which is to unlock US\$2 trillion of investment by 2030, but we also need to be realistic about what we can achieve in 3 years. One of the goals we are working towards is to create two new platforms to help bring together private sector participants and governments.

The first is what I'll call a 'capacity framework' that helps governments identify their strengths and weaknesses and — at the same time — provides the private sector with a way to track the progress countries are making towards improving their procurement process.

The second is a global pipeline catalogue where countries and national development banks can upload their project pipelines for private sector participants to review. What is different about this, however, is that we are embedding it into an IISS platform, which is essentially a World Bank procurement guide

module. What this means is that the private sector will be able to search for projects not only by size, scale and location, but also based on which projects have international advisors or where feasibility studies have already been completed.

JS: Will those platforms not also lead to improved transparency into private sector performance?

CH: Absolutely right. The platforms are designed to not only provide governments with a better picture of how they are performing, but it will also shine the light on the effectiveness of the private sector — and the national development banks — as well. I think these types of initiatives should encourage the private sector and development banks to think about how they can be more effective going forward.

JS: Have governments been receptive to the advice and support?

CH: I think you'd be surprised to know how many countries are frankly bewildered about why they are not attracting investment. But what I have found is that governments are also very interested in knowing what the private sector thinks about them and what our process does is give them a bit of a nudge in areas where the private sector has some concerns.

JS: Are there prerequisites that the GI Hub looks for before engaging with a government?

CH: For us to work with a country, we really need to be confident in a few areas. The most important is that they are committed to delivering infrastructure. Sometimes our advice is that they need to improve the clarity of decision making, set clear procurement processes and develop an infrastructure plan. And we try to provide countries with best practices and global advice at each of those stages. Once those elements are in place, we are in a better position to really catalyze change and improvement.

JS: You were named CEO of the GI Hub in June 2015. Have you had any major accomplishments in the past year?

CH: I think just setting up the GI Hub with an office and a fantastic staff of 20 was an accomplishment in and of itself. We've also made great progress in building support within the G20 and outside of it.

We have accomplished some very visible achievements with valuable results over the past year. For example, we held a conference in Shanghai for public-private partnership (PPP) units in early 2016 that drew great attendance and sparked tremendous discussion among the various governments represented. And we have made great progress on the data platforms that I mentioned earlier.

“

The past year has certainly reinforced the fact that infrastructure only improves outcomes when it is selected properly and procured efficiently.”




Chris Heathcote
CEO, Global Infrastructure Hub
@GI_Hub

We have also kicked off some important research over the past year. One recent piece looked at the views of private sector participants across various markets with regards to infrastructure investment. The data is just in, but it shows that 65 percent of the largest institutions want to increase their exposure to infrastructure, and that there is a growing interest in the emerging markets. With US\$106 trillion of funds under management, the desires of these investors is important.

We are also looking again at the infrastructure needs of countries. There has been good work done in the past looking at the global shortfall in infrastructure, we intend to look more closely at the countries and understand what their individual profiles look like as well as understanding the proportion of their needs that is likely to be met. Interesting data for the country and potential investors alike.

JS: What have you learned from your experience over the past year?


CH: I don't know if it's a new lesson, but the past year has certainly reinforced the fact that infrastructure only improves outcomes when it is selected properly and procured efficiently. I've also become an evangelist for sharing information; if we are going to be as effective as possible, we need to share information and data. Data drives performance. ■



Emerging trends in infrastructure

Barring a global economic meltdown or apocalyptic event, 2016 has already been a year of fundamental transformation for the infrastructure sector.

The signs of this transformation are everywhere: in new sources of capital and new funding approaches; in rapidly-growing capabilities in asset management, cyber security and public procurement; in the growing activity and boldness of governments seeking to catalyze economic and social benefits; and in the growing alignment between the 'macro' needs of governments and the 'micro' decisions of consumers.



Over the past 4 years, KPMG International has tracked the key trends that — in our opinion — will influence the world of infrastructure going forward. Some of the trends that we have identified in the past persist — governments continue to struggle to unclog their pipelines; emerging markets continue to face funding gaps; the optimal relationship between the public sector, the private sector and taxpayers continues to evolve. This is to be expected; massive changes to fundamental problems do not happen overnight.

As this year's Emerging Trends in 2016 suggests, however, the industry is now standing on the cusp of greater change. The development and interaction of many of these trends could very well transform the way governments, businesses and users interact with and invest in infrastructure. More importantly, if managed properly, they also hold the power to solve many of the biggest challenges facing our industry today.

1 Macro risk environment shifts: 'No normal' is the 'new normal'

Last year, we noted that political and regulatory uncertainty was creating challenges for infrastructure investors. But today, uncertainty is everywhere. Simply put, the stable conventional wisdom that once underpinned infrastructure planning and investment seem to no longer apply.

Interestingly, it's largely the emerging and developing markets that are using this uncertainty to make big plays. China's 'One Belt, One Road' project and the Asian Infrastructure Investment Bank (AIIB) initiative; Japan's significant investments into India's manufacturing and infrastructure sectors; Singapore's championing of the ASEAN community; and the Gulf States' continued investment into western assets all carry suggestions of power politics at work and more change on the horizon.

The long view:

▶ The reality is that 'no normal' will probably be the 'new normal' for the foreseeable future and investors will need to get comfortable with uncertainty and learn how to properly price these new and emerging risks.

2 Competition for investments heats up

Competition for 'investable' infrastructure projects has reached fever-pitch. In part, competition is being driven by institutional investors eager to put their capital to work. It is also being impacted by increased investment activity by multinational and sovereign sources. But competition is also pushing down the yields that investors can achieve on well-understood and low-risk infrastructure investments.

In response, a growing number of the more sophisticated and active institutional investors are starting to leverage their deep experience to take on a wider range of projects that offer the potential to deliver higher yields.

Clearly, this is good news for project owners around the world. However, governments and owners still need to understand that private capital will only be attracted (and sensibly priced) to markets that create a predictable and stable investment environment.

The long view:

▶ Over the long term, we expect this shift to permanently alter the dynamics of who takes what risks, when they take the risks and how; this may also be the tipping point that ushers in 50 years (or more) of prosperity as capital starts to match up with projects.

3 Focusing on the larger benefits to unclog the pipeline

We expect (and hope) to see governments focus on getting projects out the door rather than trying to perfect the risk balance. In fact, many governments are already starting to recognize that — by striving to take a minimalist approach to risk or to achieve structural and contractual ‘perfection’ — they have in fact been missing the point and, in doing so, have been making projects more complicated, less attractive to investors and slower to take to market.

Interestingly, it has been the developed economies that have most often trended towards interventionist activities and these markets are driving procurement innovation. But over the coming year, we expect to see many developing markets follow in their footsteps.

The long view:

Essentially, governments are starting to recognize that it is the public sector that needs to energize projects and, as such, we expect to see governments start to become more active in influencing and catalyzing their infrastructure markets.

5 Technology rockets up the infrastructure agenda

Infrastructure has remained largely untouched by the technology revolution underway around the world. We still use the same assets we did 50 years ago. And we still follow the same basic assumptions we did 50 years ago. But the reality is that the technology revolution is now upon us. And it is rapidly and fundamentally disrupting the way we plan, design, develop and operate our infrastructure.

Interestingly, much of the demand for technological advancement is being driven by consumers and by the growing alignment between ‘macro’ infrastructure requirements (such as reducing emissions) and the ‘micro’ consumer decisions (such as investing in web-based home thermostats).

The long view:

This isn't about buying into the newest technologies and consumer demands. This is about understanding the direction, pace and impact of technological change to make informed long-term decisions around investment, business models and customer service.



4 Asset management gets sophisticated

As infrastructure owners shift their focus from buying new assets to maximizing the performance of their existing assets, the need for more sophisticated asset management has risen up the agenda.

In part, this is because owners are keen to not only achieve the full expected lifespans of their assets, but also to get more productivity out of their existing operations. Advances in technology and data/analytics are also adding to the sophistication of asset management.

We believe that asset management will start to become a key discipline for asset owners, enabled by smart technologies, more sophisticated approaches and greater insight into the actual operations and performance of their assets.

The long view:

Given the pace of advancement in areas such as Internet of Things (IoT), robotics and data/analytics, it seems clear that technological advances will continue to drive efficiency in infrastructure operations and should lead to better productivity, longer asset lives, fewer catastrophic failures and improved safety.

6 Security becomes a mainstream issue

Every government, regulator, owner and operator should be worried about the security of their infrastructure. The threat of cyber-attacks on infrastructure is increasing, and the risk has been compounded by the growing interconnectedness of systems.

Part of the challenge is that few infrastructure executives truly understand their risk profiles and controls; fewer still fully understand the cyber element of the risk. The bigger challenge, however, is one of cost. Improving security (particularly for existing assets) will require investment across the life cycle — from the design and planning phase right through to operations and (in the case of nuclear facilities, for example) decommissioning.

The long view:

With political unrest on the rise in many parts of the world and several high-profile, cross-border infrastructure projects underway or currently being planned, the physical and cyber security of assets will only increase in importance, particularly to individuals and users.

7

The gap between public and private narrows

Since the 1980s, most governments have operated under the assumption that the private sector outperforms the public sector when it comes to procuring and delivering infrastructure. But this can no longer be taken for granted.

The reality is that public sector capability and capacity has significantly improved and we expect to see the knowledge gap between public and private sectors continue to shrink as the cycle of interaction, experience and improvement continues.

That is not to say that the private sector's role in infrastructure is diminishing — quite the opposite. In fact, the last few years have seen the rise of a phalanx of global developers and operators in key segments as governments continue to leverage the specialized expertise of the private sector to drive improved results.

The long view:

The movement towards privatization and public-private partnerships (PPP) over the past few decades has proven to be a catalyst to public sector improvement and should continue to drive both public and private sectors to achieve ever-higher levels of performance.

9

The institutional debt market takes off

All signs indicate that 2016 will see institutional debt markets really start to take off. Yet much will depend on how the multilateral banks choose to use their capital.

Most now believe that their capital would be better put to work by leveraging multiples of private sector capital through financial instruments that enhance the credit of the senior debt portion of the financing and, in doing so, give access to the full extent of the capital markets. The result should be a massive injection of institutional debt over the coming years.

That being said, changes in policy often take some time to translate into action so there may be some delay before the acceleration in investment takes hold.

The long view:

The big question is whether the multilaterals will be able to take the right steps at the right time to truly unlock private investment. If they are able to, the world should enjoy the massive benefits that will flow from a more-liquid debt market.

8

Innovative new ways to fund infrastructure emerging

As responsibility for investment into infrastructure starts to devolve to state and city-level governments, many are starting to look for new ways to unlock capital flows. We expect to see governments sharpen their focus on bringing forward and capturing both the current 'stores' of value and the future value that they expect their projects to deliver in order to fund its development.

Yet, to achieve this, a clear and compelling logic for the use of the proceeds of monetization — well articulated to the population — is an absolute prerequisite. At the same time, we expect to see new innovative ways of 'value capture' emerge and public authorities will get tougher and smarter with private developers who own land surrounding projects.

The long view:

Over the long term, we expect to see the more progressive emerging markets quickly adopt these methods, both at the local and at the central level, with the more risk-averse markets following up in a 'second wave' of value capture.



10

China and India have arrived

Over the past year, it has become increasingly clear that China and India are successfully making the leap from 'emerging' markets to 'developed' markets.

Interestingly, China's shift towards a developed economy is largely being driven by the country's corporate sector: China's companies (both state-owned and private) have rapidly adopted the technologies and approaches of others to quickly build their capabilities. In India, however, the shift is being driven by entrepreneurs: no longer mere subcontractors to 'western' services firms, the country's entrepreneurs increasingly play the role of principal. In particular, we expect growing influence from India in the provision of professional services, leveraging its low cost base and access to skilled people.

The long view:

While this story is only just formulating, it seems clear that the center of gravity in the global infrastructure market is fundamentally shifting towards the East. Over the long-term, expect more and increasingly sophisticated competition from these markets.

Will technology disrupt our infrastructure?

As technology starts to play an increasingly valuable — and highly disruptive — role in markets, government and society, **KPMG in Australia** partnered with the **Chartered Accountants of Australia and New Zealand** (@Chartered_Accts) to explore how new technologies will change the way we plan, fund, deliver and operate infrastructure around the world.¹ The following is a summary of the partnership's findings. Get ready for a glimpse into the future.

“Unless we carefully consider the impact technology will have on our communities, businesses and society, we run the risk of planning and building infrastructure that is outdated or unnecessary even before it is operational.”



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Technology has changed the challenges of infrastructure. It has become a disruptive — and powerful — source of innovation and renewal for the industry. The way that priorities are set and met has been transformed by the collaboration of technology in infrastructure.

The problem is that — while governments and communities can usually identify what infrastructure should be developed and where — the impact of technology on our future infrastructure requirements is often missing from the conversation. This is a shame: technology is already reshaping national infrastructure requirements and will increasingly influence how businesses and individuals use infrastructure.

Disruption is upon us

How technology is influencing the way we plan and prioritize infrastructure is evolving. Not all technology is the same and different innovations will impact infrastructure differently. According to our report, there are five themes that collectively capture the technological trends reshaping national infrastructure requirements:

- 1. Embedding technology:** Embedding technology into infrastructure assets can have a significant impact on improving asset performance, enabling asset owners to be continually informed of their asset's condition and the use of those assets.
- 2. System integration and management:** Optimizing infrastructure networks through system integration and management within

and across asset classes results in optimal utilization of existing and new assets.

3. Disruptive technology innovation:

Disruptive technology innovation in infrastructure has the potential to alter both demand and supply dynamics. Disruptive technology has the potential to drive efficiencies and in some cases make existing infrastructure obsolete.

4. Technology impacting how people use infrastructure:

Technology innovation will drastically impact how people use infrastructure and therefore what infrastructure is needed.

5. Technology impacting how businesses use infrastructure:

Technology innovation is and will continue to impact how businesses use infrastructure and therefore what infrastructure is required.

Improving the value of rail

GE is working with one of the major US railways to install sensors on tracks and locomotives to fine-tune the flow of rail traffic. Initial results show an increase in average speed of about 3 kilometers per hour, resulting in annual savings of about US\$200 million.²

Planning on a new world order

While the specific impacts of these trends may not be immediately apparent, it is entirely likely that future infrastructure requirements will be dramatically different than they are today.

¹ Will technology disrupt our existing and future infrastructure? KPMG Australia and Chartered Accountants Australia and New Zealand, September 2015

² (Source: Movement Planner System, GE Transportation, 2012)



Consider, for example, how the combination of driverless vehicles and the establishment of secondary employment hubs could significantly reduce the number of vehicles on the road and, therefore, the need for more road infrastructure. Or how advancements in eHealthcare combined with innovative service delivery models will lead to improvements in health solutions that may reduce the requirement for expanding traditional hospital infrastructure.

Unless we carefully consider the impact technology will have on our communities, businesses and society, we run the risk of planning and building infrastructure that is outdated or unnecessary even before it is operational. With the prospect of declining living standards, people will look to alternative locations for opportunity.

With this in mind, it seems clear that the conversation on future infrastructure requirements needs to be reframed from “How much more infrastructure do we need to build?” to “How can technology improve the infrastructure we have, how will technology influence what new infrastructure is required

The end of the road

An OECD study modelling the use of self-driving cars in Lisbon found that shared ‘taxibots’ could reduce the number of cars needed by 80–90 percent. A reduction in vehicles on the road will impact the demand for constantly increasing road capacity on specific routes and make some road projects obsolete.³

and will technology significantly reduce our future infrastructure requirements?”

Rethinking regulation

Focusing on the right questions will not be easy. Our governments and societies are addicted to infrastructure and are always looking for more. And investing into technology driven capacity improvements offers fewer photo opportunities than opening a new plant. Yet changes to how services and infrastructure are delivered promise to provide greater choice to users, reduce costs and allow governments to essentially do more with less: a winning situation for everyone.

However, governments also increasingly recognize that new technologies have the potential to disrupt the entire business and regulatory model of monopoly services. The transmission and distribution of electricity using ‘poles and wires’ is a typical example. Solar generation and battery storage electricity is creating unprecedented uncertainty in the electricity supply sector.

However, to date, regulatory frameworks for infrastructure services have not been designed to address either planned or unexpected service or infrastructure obsolescence. New technologies have the potential to disrupt regulatory paradigms too and this is an issue that regulatory policy makers have yet to tackle.

Can technology save us?

While there remains significant uncertainty as to what the future will bring, what is immediately clear is that we all need to

take urgent action to harness the power of technology and recalibrate infrastructure plans and strategies as the world swiftly evolves. Demographic change, workforce mobility and technological change are creating a perfect storm for infrastructure.

Without a commitment to understanding how our infrastructure needs have and will change and a willingness to invest in innovative thinking, we will find ourselves pedaling backwards and investing in projects that will be underutilized in the long term.

Our paper calls on communities, businesses and governments around the world to take notice of how the times are changing, why they’re changing and what needs to be considered in the response.

We firmly believe that the community, business and government will need to embrace innovation and change to meet the infrastructure challenge. At the same time, future infrastructure projects with long-term payback periods must be reviewed now to ensure that precious capital is not being wasted on infrastructure which, through advances in technology, may not be required.

The winners will be the countries and organizations that can adapt and lead improvements and innovation throughout the infrastructure asset life cycle and drive better outcomes with their scarce resources for their communities. The race is on to see who can do it!

To read more, visit:
**[charteredaccountantsanz.com/
futureinfrastructure](http://charteredaccountantsanz.com/futureinfrastructure)** ■

3 (source: <http://www.abc.net.au/news/2015-05-21/powerwall-solarbatteries-to-transform-electricity-industry/6488230>)

Time for a new approach to infrastructure planning and prioritization



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If everyone agrees that investment into infrastructure drives economic growth, then why are decisions being made without a view on the true economic value that those investments deliver? And, without these considerations, how is anyone effectively prioritizing their investments to ensure they are putting the right money in the right places to achieve their economic objectives?

We believe that current infrastructure appraisal and prioritization methodologies are frequently nowhere near sophisticated enough to allow governments to make truly informed decisions about their investments. It's time to rethink the way we appraise and prioritize infrastructure, and forge better links between decision making, growth and thus the revenues that ultimately pay for what is built.

The unavoidable fact is that demand for infrastructure is growing exponentially while — in most markets — the ability of government to fund these investments is dwindling. In response, many governments recognize the sense in prioritizing those investments that seem likely to drive economic growth. Most seem to understand that improved economic growth is ultimately about productivity, and that improved productivity will increase tax revenues without the need to raise tax rates.

Reassessing the true value of infrastructure

Our experience suggests that very few governments are able to properly assess the actual economic value that their investments deliver. In part, this is because current infrastructure appraisal and prioritization methodologies tend to take a very narrow view of value. As our report 'Assessing the true value of infrastructure investment' illustrates, in some markets, appraisals are simply based on a mix of feasibility studies and (occasionally) economic cost/benefit analysis. In many cases the appraisal is a way for individuals to get what they want rather than helping decision-makers understand which combination of projects merit investment.

Those — like the UK — that do include more sophisticated business case requirements into their investment process often focus narrowly on calculating what expected revenues can be generated from users and the welfare benefits to these users (i.e. their untapped willingness to pay) for an improvement, usually against the background of an assumption that the 'real economy' is fixed. In some sectors, such as transport, appraisals now incorporate an estimation of the wider economic benefits that a fixed economy, welfare based appraisal might miss.

While that is a step in the right direction, this 'missing piece' approach is too narrow, and fails to provide a complete picture of the impact a project may have on the real economy, since inevitably there are overlaps between the welfare and real economy views of the world. A better question would be how

a project will impact the real economy (growth and jobs), land values and tax revenues, and what this means for overall project affordability for the taxpayer.

Taking a broader view

Another major challenge is that most governments today tend to manage their infrastructure investments in departmental silos or (in the case of strategically important projects and megaprojects) on a project-by-project basis. And, as such, there is often little awareness of the relative value that each project delivers to the government's overall economic objectives which, in turn, makes it very difficult for governments to properly balance their investments to get the best returns.

The project-by-project view also risks ignoring important interactions between projects, which can only be addressed by looking at whole programs and across silos. In the real world, no program is ever exactly the sum of its parts.

Political vision, not political meddling

In the absence of data, methodologies and a program view, our experience suggests that politics gains much more influence in the government investment decision making process. Indeed, quite often, we find that project appraisals are used as a means towards an end, rather than as a way to assess various options.

Politicians, for example, may decide that a new airport is needed and appraisals will be conducted to find the best way to deliver that airport, or to clear a particular approvals hurdle. Very rarely does anyone question whether an airport truly delivers the best economic outcomes when compared against, say, high-speed rail or improved urban mobility projects, or a fundamentally different economic strategy based on a set of interventions in other sectors.

A new approach is needed

We believe that it is time for governments to start focusing on evolving their infrastructure appraisal and prioritization processes to reflect the real economic value and thus long-term affordability of infrastructure, and focus on programs rather than projects.

To start, governments must find a way to explore and measure the broader basket of benefits that their investments can deliver. The calculation for economic benefit should include not only traditional metrics such as 'time saved' or revenues generated, but also aspects such as impact on tax revenues and land value changes.

In many cases, governments may have other specific policy objectives that they hope to achieve (reducing the carbon footprint, for example, or improving job prospects for the poorest 25 percent of the population). These must also be understood, measured and assessed.

Better decisions and better outcomes

With this information in hand, governments should be in a position to start making more informed decisions about how they invest their budgets to optimize their policy objectives. The role of politicians, therefore, would be to set the right policy objectives and decide the right balance between them which, in turn, will enable the bureaucrats to properly evaluate and prioritize investment accordingly.

The latest developments in the UK suggest this may not mean one all-encompassing appraisal metric based on an opaque set of shadow prices, but parallel appraisals addressing key objectives and, in the case of the real economy, long-term affordability.

Just as importantly, governments need to start thinking about their infrastructure as a portfolio or program rather than as a set of discreet projects. This should allow decision-makers to better understand the relative value — and the necessary trade-offs — of each option which, in turn, should drive improved prioritization. The program approach can also help deliver balance between objectives and help deliver minimum outcomes, which is impossible at the project level.

Time to make a change

We believe that governments and policy makers need to embrace change and encourage more innovative approaches to infrastructure appraisal and prioritization.

Creating and implementing a new approach to infrastructure appraisal and prioritization will not be easy. In some cases, the right data may not be available. In other cases, governments may face opposition from stakeholders with a vested interest in maintaining the status quo.

However, we firmly believe that — to achieve the best returns on their investments, to achieve their policy objectives and to achieve better affordability for infrastructure — governments must start to evolve their approaches and methodologies. And, given the current funding gap for infrastructure, most would be well advised to start right now.

To read more on 'Assessing the true value of infrastructure investment', visit [kpmg.com/infrastructure](https://www.kpmg.com/infrastructure). ■

Making the most of infrastructure investments



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The two previous articles deliver a convincing argument to encourage governments to think more holistically about how they prioritize and plan their infrastructure investments. Here's what we think governments should be doing next.

In Australia, we spend a lot of time talking about infrastructure. We are passionate about our ports and roads. We are committed to our local hospitals and communities.

And we believe we have a fairly good grasp of the link between infrastructure and quality of life.

Yet even in Australia, we have allowed our economy to outpace our infrastructure. We are the world's 12th largest economy, yet the World Economic Forum ranks our infrastructure at 35th out of 144 countries. We ranked 32nd for our railways, 38th for our ports and 43rd for the quality of our roads. And — much like any other market

around the world — analysts have attached a massive figure to the infrastructure 'deficit' in Australia: AUD770 billion (around US\$550 billion).

Clearly, more can be done to ensure that Australia's infrastructure is creating a more productive and competitive economy. But we also recognize there are limitations on how fast and how much new infrastructure we can build — financial limitations, resource limitations and capacity limitations to name a few.



That is why we believe that governments should be balancing their attention between building new infrastructure and driving efficiency across all aspects of the infrastructure life cycle to drive incremental and valuable improvements.

Rethinking our priorities

In part, this will require governments to reassess the way they prioritize infrastructure investments to better reflect societal welfare and real economic impacts. As Lewis Atter and Said Hirsch argue in their article on page 72, the current approach used by governments to appraise and prioritize projects is generally not on the basis of the economic value they add, but on other factors.

For example, the benefit to cost analysis typically adopted on transport projects tends to focus on the value to transport users — primarily measured in direct benefits such as improved journey time, less congestion, improved safety and reductions in environmental externalities. It does not however, capture all of the benefits to the economy such as increased land valuations near the transport terminals, improved economic activity and access to jobs, and all of the tax revenues that are created as a result.

Rather than centering their assessments on conventional benefits, governments should be strengthening their approach by measuring real economy impacts of infrastructure projects and prioritizing projects that deliver broader productivity impacts. This could work side-by-side with the current appraisal approach to provide a more robust consideration of the value created by competing investments.

Leveraging technology

Governments must also focus on ensuring they are making best use of — and responding appropriately to — technological change. As the article on page 70 clearly explains, new technologies are set to change the way governments plan, fund, deliver and operate infrastructure. Simply put, technology changes everything: It has the potential to enhance the productivity of our current infrastructure leading to a lower long-term investment requirement; it impacts what infrastructure we will require for the future; and it impacts all of our funding and regulatory frameworks into the future.

Consider, for example, how the adoption of solar and the development of solar batteries

for energy storage has the potential to radically reshape the power sector and the related infrastructure investment requirements. Or how — by embedding sensors and navigation technology — Patrick Ports in Brisbane has enabled driverless container handling, which has increased capacity and delayed the need for new infrastructure investment.

Clearly, technology has the potential to drive a radical shift in the way governments plan, develop, maintain, fund and regulate infrastructure and, ultimately, can deliver massive productivity improvements.

Turning old assets into new assets

Another — equally holistic — approach governments can take to maximizing investment is to ‘recycle’ their assets in order to fund new infrastructure development. In New South Wales, Australia, the government has created a ‘Rebuilding NSW’ infrastructure plan that includes an asset recycling initiative that is expected to add some AUD20 billion (US\$14.3 billion) in funding to deliver road, rail and social infrastructure across the state.

We recently sat down with New South Wales Premier Mike Baird to talk about the initiative and the drivers behind it. “We had nothing near the funds we needed to address the infrastructure backlog we inherited. So we had to take a new approach. We looked at the balance sheet and asked ourselves, can we turn our old assets into new assets? The AUD20 billion program is a once-in-a-generation opportunity to get ahead of the infrastructure curve,” he told us.

As with most new infrastructure initiatives, the impact of the New South Wales asset recycling approach will only be known in hindsight. The shorter-term impact of the New South Wales construction stimulus will be observable over the next 5 years, but the greater (and arguably more important) outcome of improved productivity will only be known in 10 to 20 years.

What can governments do?

With this in mind and against the backdrop of the two previous articles, here are a few steps that governments can start taking in order to unlock greater value from their infrastructure investments:

- **Create a clearer narrative around project outcomes:** Place a deeper

focus on the range of outcomes to be enabled by a project at the strategic assessment phase to help ensure project solutions are robust and aligned with the public policy settings. Placing particular focus on the key drivers for a project at the very early stages will ensure a strong foundation before moving into business cases.

- **Building new infrastructure is not always the best answer — we need to build better business cases:** Create more effective business cases by succinctly defining and understanding the problems government is trying to solve, and the suite of solutions available to them. For example, instead of building a new road, the same outcome (and often a more cost effective solution) could be achieved through extensive traffic light sequencing to increase road productivity. Too quickly we’re deciding to build new infrastructure instead of looking at all the options to address our infrastructure needs including getting the most out of our existing infrastructure.

— **Embrace technology:** Embed technology in current infrastructure and/or to manage a suite of infrastructure assets to drive efficiency and cost improvements. For example, transport management systems are used to effectively manage traffic flow across a road network, which drives productivity by reducing congestion and increasing safety.

- **Encourage and adopt innovation:** Innovation provides an opportunity to improve outcomes and productivity. Infrastructure payment mechanisms, for example, can better reflect a fairer funding paradigm by encouraging greater user pays and outcomes-based payments. Innovation also means introducing greater competition to the delivery of public services to increase performance and drive efficiencies.

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All governments now recognize that they can’t increase national productivity without improving their infrastructure. Those governments that can get the most out of their infrastructure, existing and new assets, will have a powerful equation for growth. ■

Data everywhere but not on the whole-life cost of infrastructure

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John Kjorstad, KPMG in the UK, sat down with Alex Murray, University College London (UCL), to talk about his experience sorting through the complex layers of data in public-private partnerships (PPPs).

The importance of good data

It's hard to ignore the data and technology revolution that is driving disruption in established business models. Yet, when it comes to convincing governments to evolve their thinking on infrastructure, the political spirit may be willing, but the bureaucratic structure is often weak.

For 7 years, Alex Murray has been researching public procurement and the whole-life cost of infrastructure at UCL in the UK. In his quest to benchmark the operational performance of PPPs against traditional forms of public procurement — particularly for social infrastructure — he has encountered more than a few challenges, data labyrinths and stubborn viewpoints driven by political ideology.

This has made it difficult for him to answer the one question that has underlined his time at UCL: *"Does procurement impact the whole-life cost of infrastructure?"*

While a definitive answer may elude him, the insights from his quest are invaluable for governments trying to create the right environment to more effectively evaluate public infrastructure funding and the total cost of ownership. Not surprisingly, the first and most salient lesson he learned is the importance of data and good asset management.

Tearing down the silos

Murray says there needs to be more open, consistent reporting and better coordination

of information and data across public departments that are too often working in silos at different stages of asset life cycles. The constant calls for evidence-based policy in the UK over the last few years have been answered to varying levels of success. However, these individual and isolated efforts were not then embedded into civil service processes for on-going policy evaluation.

To illustrate this point, a high-ranking government official confessed to participants of an industry summit earlier this year that he gets more information from the media about what his colleagues across different transport departments are doing than seemingly occurs in direct communications with those departments. Such honesty is refreshing as the official is almost certainly not the only public leader in the world dealing with this problem.

This is the paramount observation from Murray's experience of collating public datasets to assess the whole-life cost performance of the Private Finance Initiative (PFI) and conventionally procured public service assets. While the in-house data analytic capabilities of the UK civil service is lacking (varying over functions), it's actually public sector silos that pose the greatest barrier. Improving the communication, consistency and collaboration of data between government departments is the key to making any progress with information management. It remains the government's responsibility to collect and analyze the data on the assets its departments have procured — how else can the public assess the effectiveness of capital investment?

This is not necessarily about creating new datasets. Murray says we must strive for more integration and better post-occupancy

evaluation of the data we already have — opening it up to allow proactive analysts the chance to link datasets across asset life cycles and form their own insights and innovative solutions. This in turn will push the public sector to develop more expertise internally and avoid an overreliance on the private sector.

To achieve this, the traditional realities of communicating and operating within the public sector need to change. Government organizations that don't regularly face the commercial coalface are likely to fall behind in terms of even basic information management and data analytics for improving decision making and ongoing investment planning. However, those that engage more directly with the private sector have seen their internal capability and capacity significantly improve.

Murray stressed the varying nature of competence he has observed in his dealings with the public sector as there are genuine pockets of expertise. For example, through the merger of Infrastructure UK, the Major Projects Authority and the Cabinet Office construction team into the all-encompassing Infrastructure and Projects Authority, the UK is already seeing initiatives to improve data analytics both horizontally across departments and vertically along asset life cycles. However, he waits with baited breath to see what will actually come from this.

Transparency drives understanding

In whole-life cost assessment you need transparency and insight on both the upfront capital costs (CAPEX) and ongoing operational costs (OPEX) of public service assets. The poor integration of data between

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We are entering a new era of human history where innocent privacy can be confused with shameful secrecy, and any information can be leaked or hacked.”

Alex Murray

Teaching fellow, University College London



these functions makes obtaining reliable figures a real challenge as total cost of ownership approaches have traditionally not been adopted in less outsourced forms of delivery via public finance. As a result, it is difficult to establish the true impact of this infrastructure within the broader budgets in which the assets reside and compare them like-for-like to determine value for money.

As the world moves into digital documentation, all of these challenges should become easier to manage. The confluence of information technology and society's complex web of infrastructure will improve performance as well as transparency. It should also save money. New technology and concepts like building information modelling (BIM), data and analytics, and even artificial intelligence will allow infrastructure owners to become more sophisticated stewards of our public service assets. Peak operational efficiency, better management of demand and capacity, reduction of maintenance costs and improved customer service are all possible as a result of these advancements. However, governments cannot drive these innovations alone. Private companies — including technology firms, investors, consultants and traditional contractors — should be encouraged to collaborate to promote quality, consistency and more transparency.

To date, most of the bad press and criticism that has surrounded private finance and PPPs tends to focus on the profits private finance takes by putting their capital at risk in public projects. Curious, given that private organizations have long been making profits on public contracts

with limited capital at risk under traditional business models. This is further fuelled by the lack of transparency and people forming firm conclusions based on poor data. We should be less concerned about private sector profits and more focused on bringing costs down and improving the overall efficiency of public investment. To achieve this, we need more transparency of CAPEX and OPEX costs as well as uniform data and asset management standards that track spending and performance throughout the whole-life of an infrastructure asset.

Following the leak of the Panama Papers in April, what political risk consultant Ian Bremmer called the “biggest incidence of forced transparency in world history,” the perception of unpaid taxes and a public scorned has driven political leaders to open the books on their personal finances. We are entering a new era of human history where innocent privacy can be confused with shameful secrecy, and any information can be leaked or hacked. The public clearly value transparency over commercial sensitivity and any company or individual engaging with public infrastructure should be prepared to share data and face public scrutiny.

The crux of PPPs has always been about raising the standard, improving quality and thinking about long-term value. Better data, asset management flexibility and more transparency will help the public and the private continue down this path. The challenge will be avoiding the short-term distractions caused by pipelines that never materialize, fickle annual budgets and turbulent political cycles that prevent a balanced debate on the whole-life cost of infrastructure. ■



Start listening: A pulse on the infrastructure conversation on social media



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Social media is both a driver and an enabler of change. It is beyond simply a broadcasting platform, and individuals and organizations that recognize this are the ones that are truly able to harness its power. Social media drives conversations about infrastructure; it amplifies social reaction and sentiment; it encourages transparency and empowers individuals. Simply put, social media should not be ignored. So here is what you need to know.

What is social listening?

Social listening involves tracking and analyzing what is being said on various social media platforms about a particular issue, person or organization. When analyzing the data, emphasis is placed on who is saying what (are they reliable or influential sources, for example) and the tempo of the discussion. It goes beyond monitoring interactions via your social profiles — and allows you to examine broader trends.

If you are simply monitoring your notifications, you are missing a huge piece of the puzzle; individuals that may be talking about you, your organization, and the issue in question as a whole. For a deeper look at social listening in the infrastructure sector, take a look at the article, *What infrastructure players need to know about social media*

and social listening by James Griffin and Gregory Daniel on page 38.

Are there tools or apps that help with social listening?

There are countless applications and software tools that promise to deliver insight from social media. Some of the more sophisticated enterprise tools certainly offer value. That being said, technology is only part of the equation; effective social listening comes from combining technology with experienced professionals. Linking real-time data with market expertise is where you really draw on the value of social listening.

Over the past six months, KPMG's Global Infrastructure practice has been 'listening' to social media conversations related to

infrastructure. We analyzed over 400,000 tweets and conversations and here's what we heard:

Talking about cities

When people talk about urban infrastructure, what cities are they talking about most?

1. Bangalore
2. City of London
3. Washington, DC
4. Mumbai
5. Manhattan
6. Delhi
7. Toronto
8. Liverpool
9. Hamilton
10. San Francisco

Did you know?
Nearly half of all social media conversations about infrastructure are happening 'on the go' on mobile devices



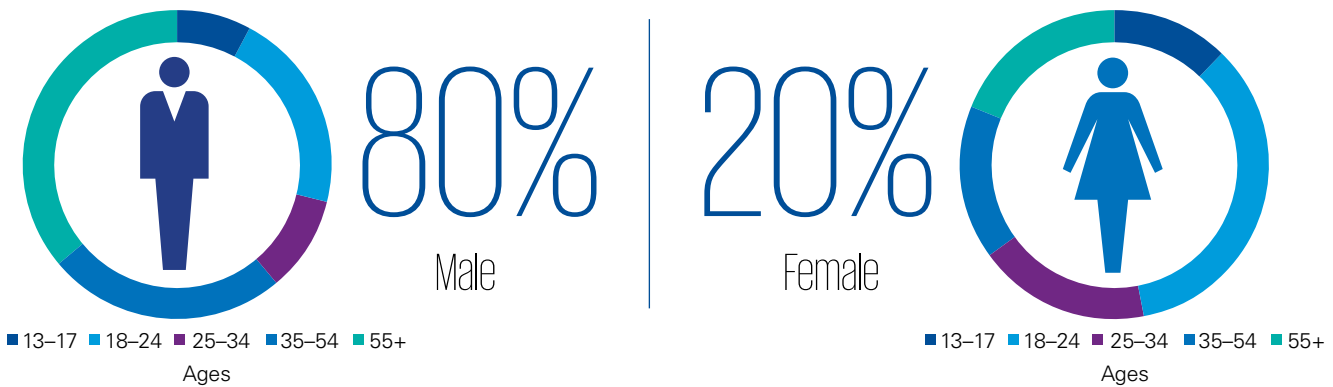
Taking a neutral tone
of social media conversations are neutral in tone but almost **1 in 9** is negative

■ Positive ■ Neutral ■ Negative

A male-dominated conversation

The infrastructure sector has always struggled with gender equality. Our data suggests that — possibly as a result — the conversation about infrastructure is largely dominated by men over 35 years of age.

Audience demographics



Follow the influencers

Social media 'influencers' are individuals or organizations that — for one reason or another — punch above their weight on

social media. Whether you are managing a sophisticated enterprise social listening program or just getting started on social

media, you probably want to be following some of these well-known infrastructure influencers.

1. Network Rail

[@networkrail](#)

2. Vinayak Chatterjee

[@Infra_VinayakCh](#)

3. InfraAmericas

[@InfraAmerica](#)

4. World Bank Group PPP

[@WBG_PPP](#)

5. The Value of Water

[@TheValueofWater](#)

6. Urban Transportation

[@UrbanTranspoRRt](#)

7. IBTTA

[@IBTTA](#)

8. Smart City Feed

[@smartcityfeed](#)

9. Infrainvestment

[@infrainvestment](#)

10. World Economic Forum

[@wef](#)

#Hashtags to remember

Hashtags essentially 'tag' a tweet or a post for others to follow. When a hashtag becomes particularly popular on social media, it is

considered to be a 'trending' topic. You can use hashtags to search for relevant posts, to create a new conversation or to air your

views on an existing topic. Here is a sampling of recent popular hashtags that are being used in infrastructure related conversations:

1. [#infrastructure](#)

2. [#HSR](#)

3. [#energy](#)

4. [#cop21](#)

5. [#water](#)

6. [#investment](#)

7. [#construction](#)

8. [#transport](#)

9. [#SDGs](#)

10. [#cities](#)

11. [#renewableenergy](#)

12. [#flintwatercrisis](#)

13. [#smartcities](#)

Infrastructure morality

As of the time of this publication, widespread conversation around 'infrastructure morality' (or #inframorality) as a topic is not taking place. That is not to say that themes and related topics around this issue are not being discussed. Topics around 'social responsibility' and 'ethics' are some of the themes that emerged when conducting our recent social listening exercise. At the outset of this publication, we highlighted that the

industry is not talking about infrastructure morality as a holistic concept, and from our findings this wrings true on social media.

As you may have gathered by now, we believe that it is important to have this dialogue. As an infrastructure practitioner, whether you are just getting started on social media, or already immersed, share your thoughts and updates concerning this topic and use the #inframorality hashtag — help

drive the conversation, and listen to what others are saying.

As decision makers in the infrastructure industry, you can use real-time social data to bring intelligence into your organization. Paired with a deep understanding of your market, the insights you glean from social media can empower you to make better informed choices about what is next.

Bookshelf:

To access the publications listed here, visit: kpmg.com/infrastructure or email us at: infrastructure@kpmg.com

INSIGHT: THE GLOBAL INFRASTRUCTURE MAGAZINE

Insight is a semi-annual magazine that provides a broad scope of local, regional and global perspectives on many of the key issues facing today's infrastructure industry.



Issue No. 7 – Who controls our infrastructure?

This edition explores some of the big challenges and trends influencing the debate around infrastructure control. It also includes a Special Report on Rail, a sector often at the epicenter of the debate around control.

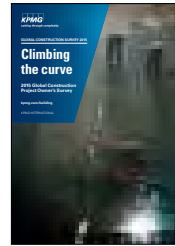


Issue No. 6 – Population

This edition takes a closer look at the unprecedented population and demographic shifts currently underway and the infrastructure needed to meet those challenges. It also includes a Special Report on Asia Pacific's infrastructure market.

GLOBAL CONSTRUCTION SURVEY SERIES

The Global Construction Survey monitors engineering and construction issues to provide timely insights that help clients make informed decisions.



2015 Global Construction Survey: Climbing the curve

In the ninth edition, we focus on the challenges facing owners as they strive for a balance between power, responsibility and control. This report gauges the views of over 100 senior executives of leading private and public organizations from around the world.

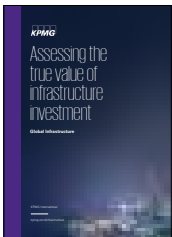


2013 Global Construction Survey: Ready for the next wave?

The 2013 report catches the industry in a more upbeat mood after gauging the views of 165 senior executives of leading engineering and construction firms from around the world to determine industry trends and opportunities for growth.

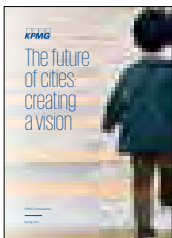
GLOBAL INFRASTRUCTURE REPORTS

KPMG member firms are privileged to work across many sectors and at various stages of the life cycle of infrastructure. We continuously seek to share the insights we are gaining in the process.



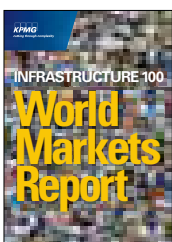
Assessing the true value of infrastructure investment

Based on global research and supported by case studies, this report provides valuable insights on the current infrastructure assessment and prioritization process in Brazil, India, South Africa and the UK.



The future of cities

This article series addresses the challenges and opportunities facing cities as urbanization changes the dynamics of our world, and how we can work together to create better, more sustainable places to live and work.



Infrastructure 100: World Markets Report

In this third edition, KPMG highlights key trends driving infrastructure investment around the world and a global panel of independent industry experts identify 100 of the world's most innovative and impactful projects.

FORESIGHT: A GLOBAL INFRASTRUCTURE PERSPECTIVE

Foresight is a series of articles that feature our take on the most recent topics, trends and issues facing our firms' clients.



SPECIAL EDITION: Emerging trends in 2016

In the fourth edition of this special report, three of KPMG's Global Infrastructure leaders share their views on new trends that will influence the world of infrastructure in 2016 and beyond.



Nuclear power: Is small really beautiful?

Anurag Gupta looks at the important role small nuclear reactors (SMRs) can play in generating clean, affordable power as they offer faster construction at a lower cost than conventional nuclear plants.



Visualization: The future of decision-making in capital projects

Puneet Narang explains how visualization techniques such as drone monitoring of capital construction projects can help owners and contractors save time and money.

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Impartial advice

Industry experience

Nobody knows infrastructure like KPMG. Every day, our network of more than 2,500 highly-experienced professionals work shoulder-to-shoulder with infrastructure leaders across more than 150 countries to share industry best practices and develop effective local strategies.

Our clients see a difference. They recognize that we won't just apply traditional methodologies to new problems because infrastructure projects are unique and often require tailored solutions. We challenge infrastructure to be better, integrating innovative approaches and deep expertise to help clients succeed transparently, sustainably, ethically and commercially. Our clients are confident KPMG's Global Infrastructure professionals will provide trusted insight, actionable advice and market-leading services across advisory, tax, audit, accounting and regulatory compliance.

We inspire confidence and empower change in government organizations, infrastructure contractors, operators and investors. Our member firms help clients ask the right questions that reflect the challenges they are facing at every stage in the life cycle of infrastructure assets and programs. From planning, strategy, finance and construction through to operations, divestment and decommissioning, our Global Infrastructure professionals apply passion and purpose to help clients solve some of the most significant challenges of the 21st century.

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