



# MOVING CITIES

## LESSONS IN BUILDING FOR A BETTER FUTURE

Indonesia's planned new capital city must serve the needs of tomorrow's generations as well as today's. To be sustainable, promoters and sponsors can learn from the growing pains of other cities and give Kalimantan room to grow in unknown and perhaps surprising directions, writes AECOM's **Scott Dunn** and **Sylvester Wong**.

**W**ith a population of over 10 million,<sup>1</sup> Indonesia's capital city is bursting at the seams. Originally designed for a planned population of 800,000, Jakarta is becoming starved of resources such as drinking water, while crippling congestion impacts life and air quality. Weighed down by its fast-growing population, which has doubled in 50 years, the island capital is also sinking<sup>2</sup> — by an estimated 25 centimetres per year in some areas due to subsidence.

To address these concerns and capture the aspirations of a growing nation, the government is building an entirely new city to position Indonesia for growth and ultimately to take on a bigger leadership role in Asia and globally.

The new site in East Kalimantan, on the island of Borneo, was chosen for its resilient location, room for growth, and its more central location within Indonesia. The 400-square-kilometre plot of land comes with a \$US 33 billion (466 trillion rupiah) price tag. Making



**THE GOVERNMENT IS BUILDING AN ENTIRELY NEW CITY TO POSITION INDONESIA FOR GROWTH**

such an investment worthwhile, both economically and in sustaining natural resources, means ensuring future generations aren't saddled with expensive retrofitting. Predicting the future 50 years out is hard enough. Encouraging promoters and sponsors to think on these timescales — which exceed even the most forward-looking of government planning — is even a bigger challenge. ➔

To be sustainable, the megaprojects of the future must embrace the complex world they will inhabit, with enough built-in flexibility to adapt to the circumstances of tomorrow. So, what should Indonesia consider in its planning? And what lessons can be learned from other cities wrestling with growth, adapting to innovation and struggling to become more resilient to unforeseen stresses?



**PLANNING A NEW CITY FROM SCRATCH IS NOT JUST ABOUT DOING A GOOD, LONG-TERM MASTERPLAN TO ENSURE THAT LAND IS EFFICIENTLY USED TO ACCOMMODATE SUSTAINABLE GROWTH. MORE IMPORTANTLY, IT IS ABOUT MAKING SURE THAT PEOPLE WILL LIVE, WORK AND PLAY COMFORTABLY WITH ENOUGH HOMES, JOBS, TRANSPORT, COMMUNITY AND RECREATIONAL SPACES THAT ARE PROVIDED IN A TIMELY MANNER WITH A GOOD DEVELOPMENT STRATEGY THAT INVOLVES THE PUBLIC AND PRIVATE SECTOR AND THE NEW COMMUNITY COLLABORATIVELY.**

**KHOO TENG CHYE (MR) EXECUTIVE DIRECTOR, CENTRE FOR LIVEABLE CITIES**

To be future flexible, adaptability must be baked into the very beginning stages of the masterplan — and at every opportunity along the way.

### **Population flux — and how to plan for it**

Indonesia is planning to develop 40,000 hectares of land for its new capital, housing an estimated 1.5 million residents, according to Planning Ministry estimates. These estimates could ultimately be influenced by many variables. For example, will current Jakarta residents retain their family homes, or will people from other regions and countries migrate to the new capital in search of better economic opportunities? If the population grows unexpectedly, is the infrastructure flexible enough to adapt and accommodate? Building with room to grow is essential. To ensure vibrancy, the new capital will need more than just homes and jobs — it will need a real core, culture and identity — and the infrastructure to support it. ➔

# 100%

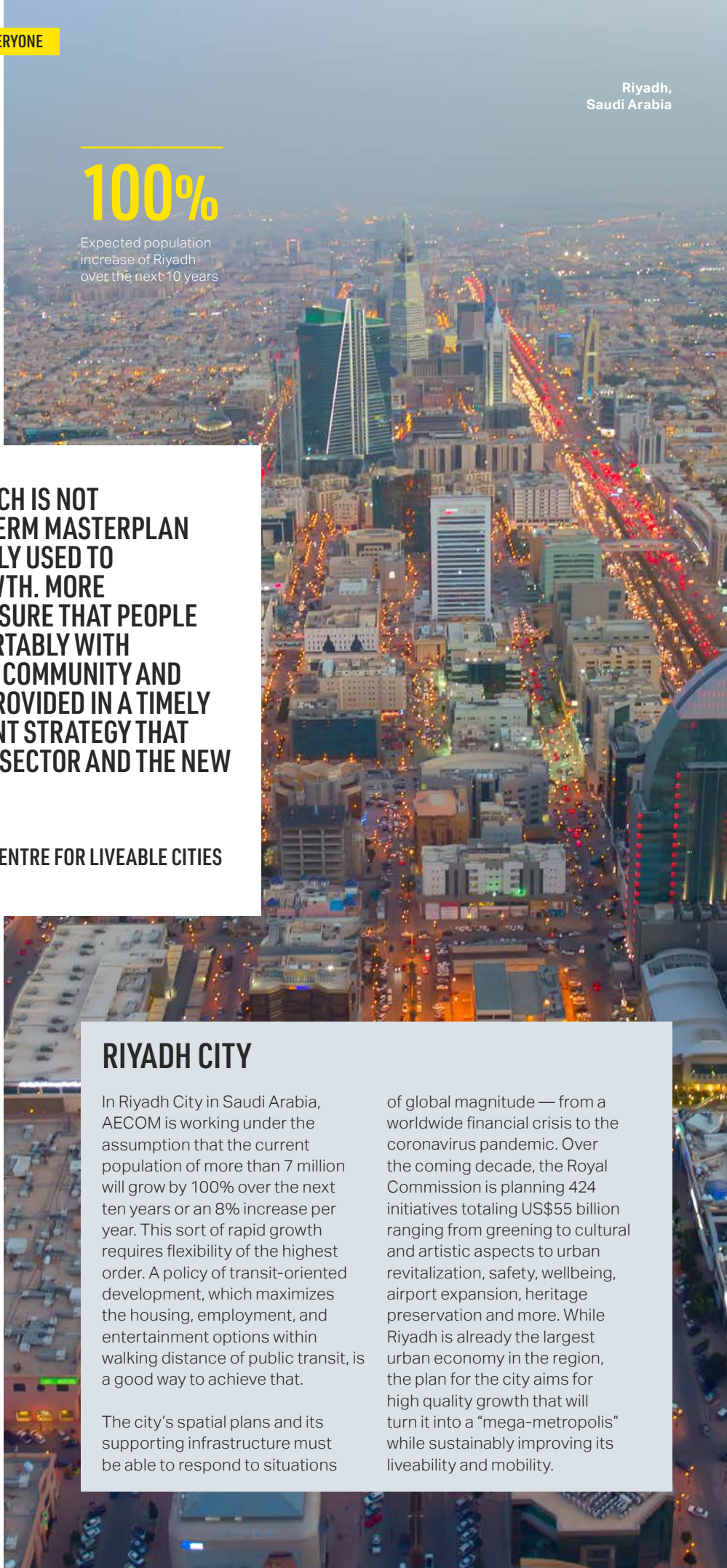
Expected population increase of Riyadh over the next 10 years

## **RIYADH CITY**

In Riyadh City in Saudi Arabia, AECOM is working under the assumption that the current population of more than 7 million will grow by 100% over the next ten years or an 8% increase per year. This sort of rapid growth requires flexibility of the highest order. A policy of transit-oriented development, which maximizes the housing, employment, and entertainment options within walking distance of public transit, is a good way to achieve that.

The city's spatial plans and its supporting infrastructure must be able to respond to situations

of global magnitude — from a worldwide financial crisis to the coronavirus pandemic. Over the coming decade, the Royal Commission is planning 424 initiatives totaling US\$55 billion ranging from greening to cultural and artistic aspects to urban revitalization, safety, wellbeing, airport expansion, heritage preservation and more. While Riyadh is already the largest urban economy in the region, the plan for the city aims for high quality growth that will turn it into a “mega-metropolis” while sustainably improving its liveability and mobility.





**TRANSPORT HAS ALWAYS BEEN ONE OF THE MOST POWERFUL TOOLS AVAILABLE TO CITY OR REGIONAL PLANNERS. WELL DESIGNED AND DELIVERED TRANSPORT PROJECTS HAVE ALWAYS DRIVEN ECONOMIC GROWTH, GENERATED LAND VALUE AND SUPPORTED COMMUNITIES. BUT INCREASINGLY, TODAY, THE BEST TRANSPORT PROJECTS HAVE THIS KIND OF BROADER IMPACT BUILT IN AT THE EARLIEST STAGES, AS A CRUCIAL ELEMENT OF THEIR DNA.**

—  
MARK WILD, CEO, CROSSRAIL

### **Transportation needs are changing — and may evolve in unforeseen ways**

Transportation infrastructure is fundamental to a city's economic, social and mental health. Investment today can serve a city's mobility needs for decades to come. But failing to account for flexibility could result in the sort of congestion and overcrowding seen in many of today's cities. Megaprojects like the one Indonesia is planning must consider incoming changes — from autonomous and connected vehicles, to aerial transport or hyperloop technology — that can influence planning and the infrastructure to support it.

The Government of Indonesia is ahead of the curve: it has announced that the new capital will be the first city in the world operating solely with autonomous and electric vehicles. Many of these are likely to be provided by Mobility as a Service (MaaS) providers combining public and private transport options which users can access on demand. The movement of goods, which typically makes up to 30 percent of trips, can be consolidated with regional distribution centres and last kilometre connections with drone deliveries. If such services are as efficient as they claim to be, the days of individual car ownership and congested roads could be drawing to an end. Liberated parking lots and kerbside space could be put to better use. ➔

### **BUT WHAT ABOUT THOSE CHANGES WE CAN'T FORESEE?**

One approach is to protect designated physical right-of-ways with strong governance and guidelines — as seen with the Bloor Street Viaduct in Toronto, Canada. This major bridge over the Don River valley was built 100 years ago, long before anyone thought about a subway. Yet project designers built in a provision for a rail crossing on a level below the bridge deck. Half a century later, this became the future alignment of the Bloor-Danforth Subway (Line 2). Thanks to that, the subway was built at a fraction of the cost — and with less disruption — than if a separate crossing had been required.

Another approach, from Europe's largest construction project, is to ensure the public transportation is much more than just getting people

from point to point. With more than 100 kilometres of rail spanning London from east to west, Crossrail aspires to completely transform the urban realm around its train stations through a multi-pronged approach taking into consideration everything from historical preservation to improved traffic flow, flood protection and security measures to enhanced public open space.

AECOM's work collaboratively designing and advising on the public realm and infrastructure for Crossrail's Farringdon and Paddington stations showcases the opportunity to create a pedestrian friendly urban realm that improves safety, utility, capacity and the overall patron experience. Plans feature public art displays, street furniture and landscaping that can easily be adapted to keep pace with the changing personality of the surrounding neighbourhoods.



## Flooding in Indonesia



### Preparing for unforeseen shocks

Beyond the more predictable considerations of population growth and transportation, are other challenging factors. Climate change, for example, is becoming increasingly erratic, and global pandemics are clearly no longer a distant possibility. To meet these challenges, our infrastructure needs to become more resilient. In the past, we've relied as an industry on historical data to forecast future events, some of it of poor quality. This is no longer sufficient. Designers must broaden their consideration of weather patterns to include the predictable annual events as well as the more unpredictable 'once in a century' type occurrences.

As in much of Southeast Asia, Kalimantan often experiences severe flooding during the inevitable annual monsoon season — and built up spaces will only exacerbate this. In the past, making the case for funding such 'unforeseens' has proved difficult. Some have argued that money spent protecting infrastructure against things which might never happen could be better spent on more concrete needs. Once in one hundred-year incidents, such as Hurricane Sandy and even the coronavirus pandemic, have changed that thinking. Today, resilience should be built into megaproject planning right from the masterplan.

Whereas Kalimantan has the luxury to plan, older cities require retrofitting. In developing New York's master plan for Lower Manhattan coastal resilience, AECOM had to consider a diverse set of current and future public needs spanning a number of adjacent spaces as part of our design efforts.

One of those projects is South Battery Park. This unique stretch of coastline involves rebuilding Wagner Park with a hidden, passive line of protection that enhances the public space and potential for economic development. The project aims to protect the neighbourhood and the people who live in it by reducing flood risk due to coastal storms and sea-level rise. At the same time, the goal is also to improve waterfront access so the community benefits even when there is no flooding or other risk.\*

As the Lower Manhattan resilience work spans 10 continuous miles (16.09 kilometres) of coastline, there are several stakeholders involved. Each of the distinct sections of waterfront is planned and funded differently, and discussions are ongoing to explore new sources of cross-sector funding and financing,<sup>3</sup> as well as ways to capture future value generated by resilience projects to help bridge the funding gap. These lessons are relevant to planning for Kalimantan.

### Making the financial case for Kalimantan

The government plans to fund around 19 percent of the total US\$33 billion cost, with the balance coming from other sources. At the same time, the Indonesian government has announced its intent for a monumental \$412 billion nationwide infrastructure spending plan spread across 17,000 islands. To date, committed funds remain elusive for both projects, and a significant portion of funds will likely have to come from private sector finance, institutional funds and even the growing global green capital market.

Private equity finance and institutional fund participation in large-scale infrastructure are increasingly popular tools, going hand-in-hand with land development opportunities for local and foreign investors that would otherwise be difficult to secure. This may be the next evolution of the infrastructure-as-a-service model, moving away from traditional subsidy-heavy financial structures.

The rail-plus-property model of Hong Kong's MTR is a prime early example, with over half of the transit system's revenues generated through property development and management. In this post-pandemic era where recurring income from infrastructure tariffs and fares are vulnerable, diversification of cash flows can keep essential infrastructure viable. This goes beyond the tax-increment value capture that is already popular in the U.S.; the primary revenue stream comes from integrated commercial real estate rather than the infrastructure itself.

Early hesitation to cede national lands to foreign owners is being addressed through creative land lease frameworks and asset divisions that keep lands in the hands of nationals. This has enabled the likes of Japanese tech conglomerate Softbank and the Emirati Sovereign Fund to explore partnerships to develop portions of the capital in exchange for underwriting support. ➔

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**\$33bn**

Cost of the land for Indonesia's new capital city

**\$412bn**

Cost of Indonesia's nationwide infrastructure spending plan

But international investors are increasingly demanding more than financial returns and guarantees. Resilience targets and environmental, social and governance (ESG) targets may include pandemic readiness, digital readiness, a diverse portfolio of economic engines, measures of equity and inclusivity as well as preservation of authenticity. These sorts of measurements can serve as a framework for other countries or investors with similar goals wanting to participate or invest in the Indonesian government, helping them realize their dream of moving the capital city.

In neighbouring Philippines, the nation's own backup centre for government is emerging at the US\$23 billion New Clark City. The 9,000ha master plan by AECOM is now the focus of the nation's first government green development bond, with hopes of attracting ESG-minded private investment to realize its original vision for a sustainable and resilient city of one million people.

### Managing Complexity

From the constrained streets of London to the sunken Egyptian city of Heracleion, history is littered with examples of megaprojects that have failed the sustainability test. The promoters and sponsors of sustainable infrastructure must be flexible and persuaded to plan and finance for a future they can't yet imagine — and which they might never see.

It would, however, be naive to expect the financiers of Indonesia's new capital to invest in an unspecified future. A more compelling argument must be developed around making long-term sustainability deliverable within the parameters that constrain the promoter (cost, time, space, technology, resources, knowledge, etc.). Ideas around passive provisions, elimination of pinch points, adaptability, market trends, demand and other topics will be required. Behind it all is the need for the managers of megaprojects not to limit themselves to what they know now, but to be flexible and adaptable to ensure that their projects thrive for generations to come. **WL**

This article builds on The era of sustainability-enabled megaprojects: lessons in building to deliver for an unknown, better future by AECOM's Jim Manning and Mariella Tsopela. Their submission was voted best sustainability paper at the MeRIT Megaprojects Research Interdisciplinary Team conference in Milan, 2019.

Izlem Boylu, Alan Gibbs, James Kirkpatrick, Mike Pauley, Sacha Schwarzkopf and Joel Sonkin contributed to this article.



**THE PROMOTERS AND SPONSORS OF SUSTAINABLE INFRASTRUCTURE MUST BE FLEXIBLE AND PERSUADED TO PLAN AND FINANCE FOR A FUTURE THEY CAN'T YET IMAGINE – AND WHICH THEY MIGHT NEVER SEE.**

Jakarta, Indonesia's existing capital city

