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Beyond smart cities: why smart and sustainable cities are the way forward

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Sandy Gwee, principal consultant at Singapore's Nomura Research Institute, says to succeed, sustainable smart cities must encompass multiple facets of sectors, stakeholders and communities that need to be engaged and mobilised to build on common goals.





Singapore is accelerating its drive to become a smart, sustainable nation

In this year's World Cities Summit held in Singapore, it is evident that sustainability is a key pillar of city and urban planning with respect to lowering a city's carbon footprint. During a panel session, [David Wallerstein](#), chief exploration officer at Tencent Group, emphasised the role of city planners to proactively engage the community to address key challenges, complex and evolving needs of smarter and green cities enabled by new technologies.

He highlighted the importance of promoting more seamless collaboration amongst the stakeholders to accelerate the development and adoption of new technologies and solutions to address critical challenges – an essential first step of engaging the community to develop a “challenge targeting roadmap” that can be broken into a time-horizon of short-, medium-, and long-term challenges.

During the pandemic

When the pandemic struck, smart city development that had been taking place over the years suddenly had to shift gears. Smart city technologies, which were focused on resolving day-to-day issues stemming from urbanisation in pre-Covid-19 times – including waste management and transportation – were swiftly diverted to assist with the frontline response to the pandemic.

Asean countries have deployed various smart city technologies in their attempt to manage and control the pandemic. In Indonesia, smart city infrastructure – which has

optimal decisions – was repurposed to facilitate disease-monitoring and recovery efforts.

Command centres across Indonesia were transformed into “Covid-19 War Rooms” to detect Covid-19 hotspots and monitor the implementation of social distancing measures. Likewise, in Singapore, perhaps one of the most visible and widely used initiatives of the government’s Covid-19 response was the roll-out of the TraceTogether app, which exchanged anonymised proximity information to track data such as the distance between users and the duration of the encounter.

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As countries like Singapore begin developing roadmaps to live with and alongside the Covid-19 endemic, the associated smart city solutions and applications are expected to remain essential in enabling new ways of living and working. Despite social distancing measures easing, governments continue to proactively capture and process real-time data to better inform their policy decisions. For instance, the digitalisation of safe-entry procedures would enable the capture and analysis of real-time data for contact tracing and crowd management in buildings, restaurants and even parks.

The pandemic has sped up the inevitable proliferation of smart city solutions with citizens increasingly adopting technology as remote operations and transactions transcend work, study and overall way-of-life. This overwhelming shift has created key opportunities and risks for enterprises across the value-chain, particularly as enterprises need to assess and respond to the emerging smart city trends and broader digitalisation in the consumption of goods and services.

The medium term

While the pandemic has laid bare the importance of smart cities in providing robust

the next two to five years – needs to focus on sustainable development and strengthening its resilience in the face of future shocks.

Furthermore, according to C40 – a network of the world’s megacities committed to addressing climate change – the climate impact and energy footprint that cities leave behind are disproportionate, even though they occupy only two per cent of the world’s landmass. Cities consume over two-thirds of the world’s energy and account for more than 70 per cent of global emissions. Amid a renewed urgency to deliver both sustainability and economic goals, cities will need to engage stakeholders and embed sustainability initiatives as an integral part of its design and development plans, so that sustainable systems can better meet citizens’ needs in the longer run.

In Thailand, energy company Impact Solar recently announced its development of Thailand’s [largest privately owned microgrid in Sriracha](#). The 214MW microgrid will comprise gas turbines, rooftop solar and floating solar systems as power generation resources, and a battery storage and control system. This is one of the many sustainable developments in a country that aims to achieve 100 smart cities by 2024 and pursue low-carbon economic development as part of its broader Thailand 4.0 plan.

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In Singapore, in addition to a number of smart energy solutions including energy efficiency programmes, the government is exploring opportunities to accelerate its drive to transform into a sustainable smart nation. One quick win to energy efficiency was a project called [“Cooling Singapore”](#), which explores the use of cool paints and reflective glass coatings to reduce the urban heat island effect.

The next step will be to ensure that digital infrastructure is optimally designed to incorporate environmentally sustainable elements, amidst Singapore’s growing digital economy. The massive shift to home-based work and learning during the pandemic has not only set the future pace for digital infrastructure expansion but also the future prospects of smart city technological enablers such as 5G technologies and devices.

The growth in demand for data centres would mean that truly smart cities will have to adopt efficient and sustainable approaches that deliver net-positive outcome for the society; for instance, net-zero buildings and the use of green technology to improve energy and water efficiencies.

The long term

While artificial intelligence technology and connectivity lie at the foundation of future smart cities, the long-term goal of sustainable smart cities should go beyond nurturing the maturity of information and communications technology, which facilitate a range of optimal solutions from design and development to operations and maintenance.

Instead, smart sustainable cities should be modelled on the self-sustaining resilient structure of [natural ecosystems](#) and support transitions to circular economy, carbon neutrality and equitable growth for all. Sustainable smart cities have an inherent ability to govern a myriad of decentralised supply and demand points towards equilibrium; thus, limiting waste or constraints in real-time or in a timely manner. In order to do this, innovative smart city solutions will not only drive efficiency, but also align [individual behaviours](#) to support the achievement of citywide objectives.

It is necessary to go one step further to embed a culture of sustainability, as the success of a smart sustainable city will largely depend on its community to be fully engaged

Take for instance, the goal to curb waste generation to reduce pollution and carbon footprint. Against a backdrop of 40 million tons of waste, including four million tons of plastic waste, flowing into the environment, the Indonesian government has set national targets to reduce waste reduction.

A report by systems change company SystemIQ found that Indonesia's waste problem calls for new regulations that would shift full responsibility of waste management to the district or municipal governments. These changes will encompass information campaigns and law enforcement that focus on reducing the burning of waste and other environmentally harmful disposal as well as behavioural shifts at the community level to the 3R principles of reduce, reuse and recycle.



On the smart mobility front, Singapore has announced that it will be phasing out traditional engine combustion vehicles by 2040, while setting a target of 60,000 electric vehicles (EVs) charging points by 2030.

The government will also be lowering the Additional Registration Fee, a tax paid when registering a vehicle, floor to zero for electric cars from [January 2022 to December 2023](#). All of this serve to incentivise citizens' attitude towards the greater adoption of shared mobility and EVs towards decarbonising the country's transport sector.

As cities are expected to grow, there is a complex interplay of various smart city aspects that would need to be taken into account to enhance the liveability and sustainability of a city. Through technology and data analytics, cities can better optimise urban infrastructure and facilities, and can also better advise policymakers on consumer attributes, resident behaviour and key environmental figures such as pollution levels and hazardous areas of concern.

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It is necessary to go one step further to embed a culture of sustainability, as the success of a smart sustainable city will largely depend on its community to be fully engaged in sustainable activities enabled and enhanced by technological solutions.

A truly smart city will collate and address current key issues, but also mitigate emerging challenges that can potentially result in high socio-economic costs. The acceleration of not only smart, but sustainable smart cities will be critical. Bearing in mind that there is no one silver bullet, sustainable smart cities encompass multiple facets of sectors, stakeholders and communities that need to be engaged and mobilised to build on common goals such as the efficient use of resources to improve quality of life.

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