

The road to better pandemic planning

Digital tools are providing new data on what a city needs to be crisis-ready. A key lesson is that urban design plays an important role, right down to the length of streets.

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For *The Straits Times*

The Covid-19 pandemic resulted in many valuable lessons for Singapore, ranging from medical advances to how to keep the economy moving well in a crisis, but here is one that will be new to many people: the vital role that good urban planning can play.

Urban design can play a part in many ways, such as in facilitating social distancing, improving ventilation and creating new spaces or adapting existing ones for treating patients or storing medical supplies, for example.

One striking example is that the design or layout of a city, right down to the length of streets, can either spread or curb infections.

For instance, an urban planning guide titled *Streets For Pandemic*

Response And Recovery, published by America's National Association of City Transport Officials, advocates footpath extensions and "slow streets" that can easily be closed off to traffic during a pandemic. These would help reduce infection risk among urban-dwellers as well as providing additional open outdoor spaces.

Policymakers are already documenting lessons learnt from each pandemic – the Minister for Health's Pandemic Readiness and Response Plan for Influenza and other Acute Respiratory Diseases is one good step forward. However, as Singapore continues to plan for a post-Covid-19 world, it is essential that the authorities include urban design in this, and in anticipation of future outbreaks of infectious diseases.

TECHNOLOGY AND MODELLING

Unlike past pandemics, this one

happened in the digital age, which means, among many other things, that planners and policymakers are using tech tools to help plan ahead for the next pandemic.

One example is that architects and planners have developed virtual representations of cities and buildings known as "digital twins". Updated with real-time data and supported by machine learning processes, digital twins allow planners and architects to simulate and measure the impact of environmental changes on a city or district.

Here right at home, our digital twin is "Virtual Singapore". Co-developed by the National Research Foundation (NRF), the Singapore Land Authority (SLA) and the Government Technology Agency of Singapore (GovTech), it is a digital three-dimensional model of Singapore.

Policy makers can easily simulate an infectious disease outbreak on Virtual Singapore and assess its potential impact on communities. This will in turn help inform our urban plans and allow planners to design more pandemic-resilient urban spaces.

Tech-enabled modelling processes have already resulted in

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urban planners making discoveries that will enhance the pandemic resilience of a city.

For instance, a spatial analysis of Covid-19 clusters in Hong Kong revealed that neighbourhoods with a greater variety of building heights – or "rough surfaces" – improved ventilation and airflow, which reduced the spread of the virus.

The same study also found correlations between road length and design with infection clusters, with longer and more circuitous roads serving to reduce infections by spreading pedestrians out over longer spans of roads.

More broadly, a study of intra-urban flows in the United States revealed that cities with centralised nodes tend to be more vulnerable, while cities with multiple centres of activity tend to naturally slow down the spread of an infectious disease, giving officials more time to react to an outbreak.

Through this abundance of data and tech-enabled ability to make sense of this data, urban planners can now confidently design our streets and neighbourhoods with an eye to enhancing pandemic resilience through

smart urban design.

ADAPTING EXISTING SPACES

Beyond technology and modelling, the Covid-19 pandemic has also required Singapore to look at how to use spaces in new ways.

As Minister for National Development Desmond Lee noted in June last year, the Covid-19 pandemic has shown how important it is for Singapore to buffer some "white spaces" that can quickly be converted into quarantine and community care facilities.

For instance, exhibition halls at Singapore Expo were converted into community care facilities when infections surged.

With their cavernous interior spaces and large entryways, exhibition halls could accommodate the movement of medical equipment and beds. Through partitioning and segregation, these halls could also accommodate large numbers of patients.

In Spain's capital of Madrid, the existence of multi-utility tunnels in the IFEMA Trade Fair and Exhibition Centre allowed for the supply of medical gases and new electricity lines as well as secure Wi-Fi access to the city's digital hospital platform.

Such efforts to adapt or modify existing urban infrastructure for the pandemic should not be seen as one-offs.

During his National Day Rally, Prime Minister Lee Hsien Loong announced that Changi Airport's Terminal 5 has been redesigned to be pandemic-ready. This includes enhanced ventilation systems and higher degrees of automation to reduce viral transmission, as well as more flexible spatial design so terminals can be converted for uses such as testing and isolation.

Our public spaces and venues will therefore need to be designed with a greater degree of flexibility, with urban spaces easily convertible into isolation or patient care facilities.

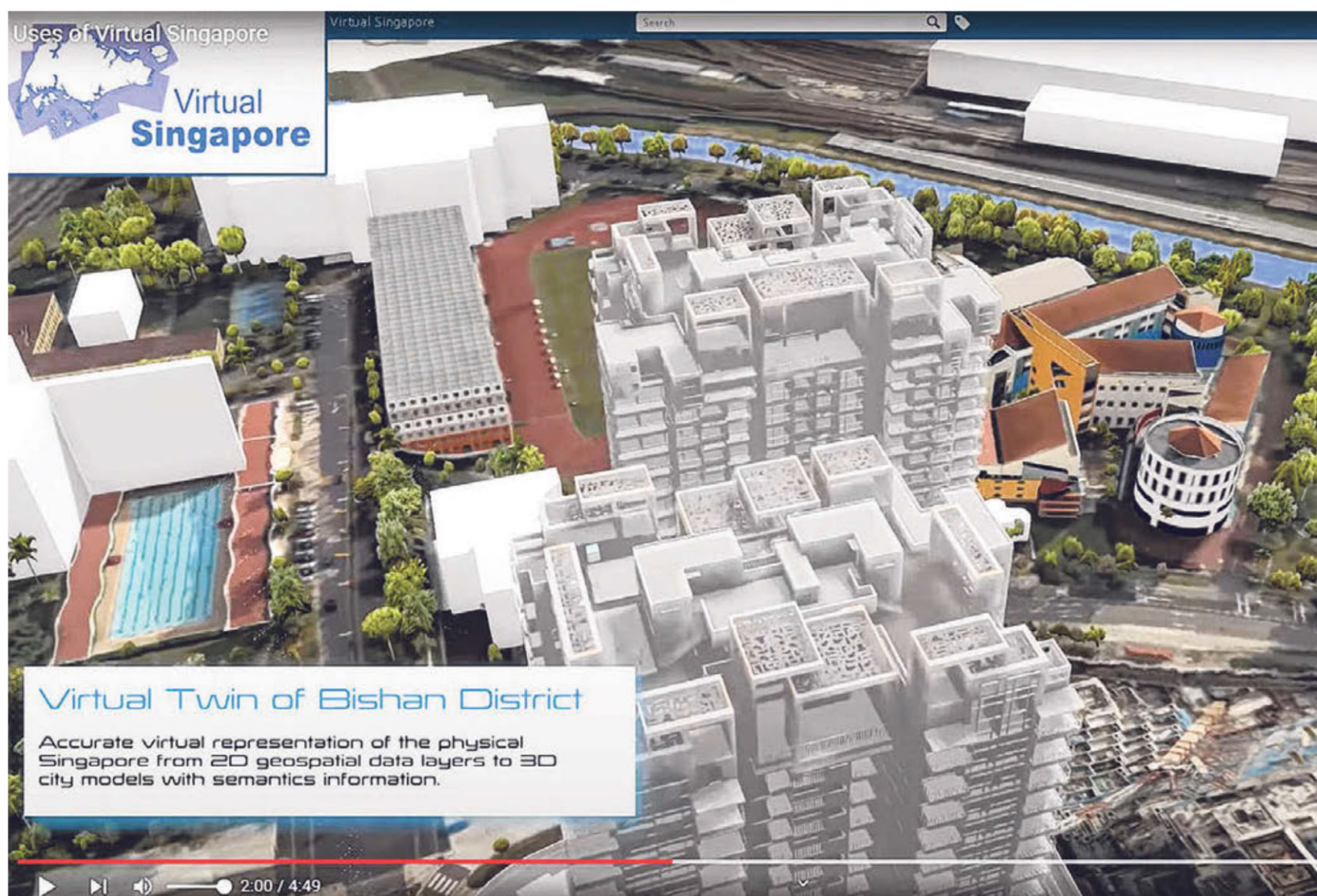
PLANNING FOR PANDEMIC READINESS

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The city can then be mobilised to combat future pandemics, with pandemic-ready urban designs providing urban "muscle memory" based on its experience of Covid-19. As Singapore considers its future urban development, spurred by the Urban Redevelopment Authority's recent Long Term Plan Review, it will need to place crisis and pandemic response at the front and centre of its urban planning needs.

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