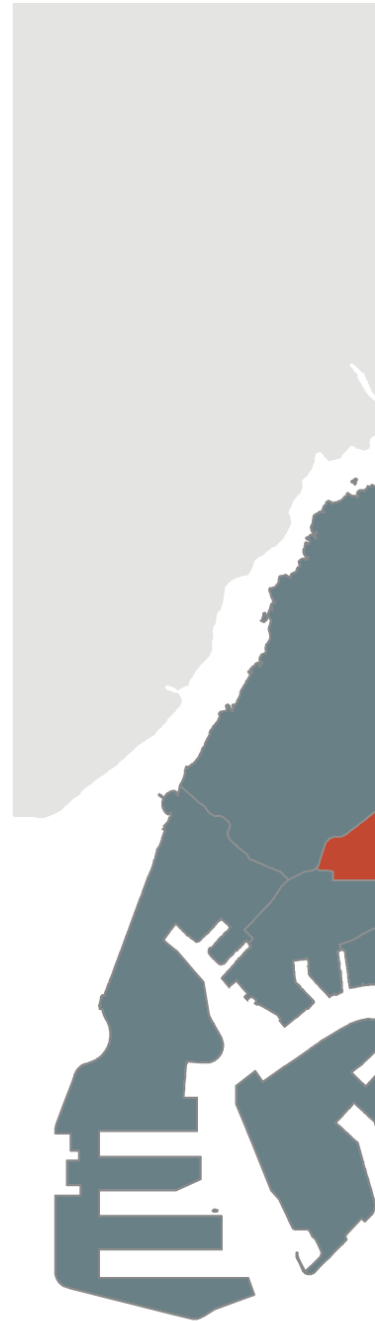


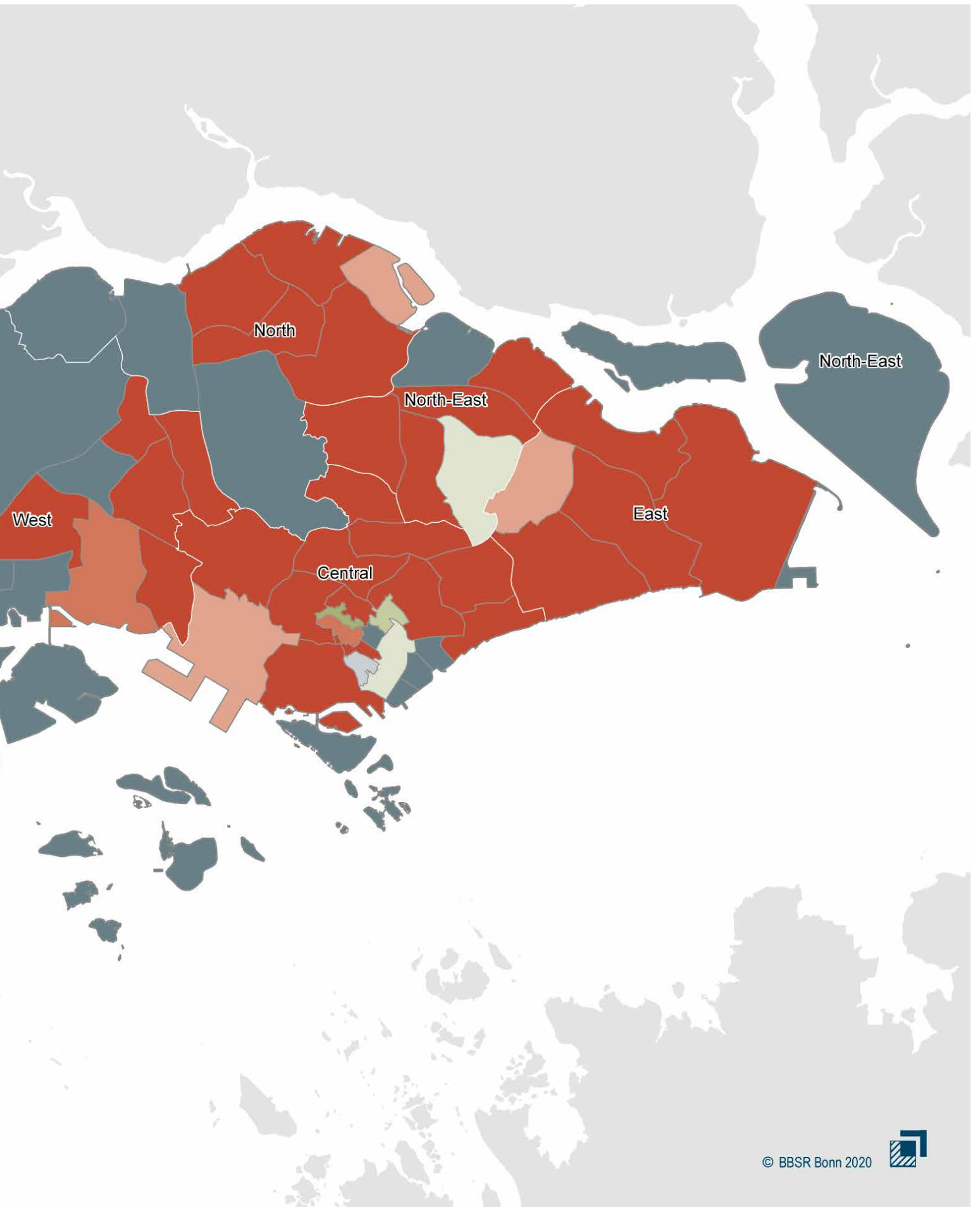
MONITORING URBAN DEVELOPMENT IN SINGAPORE

In this interview, Mr Khoo Teng Chye shares some insights on how Singapore has taken a systems approach to integrated planning and urban governance at various scales in the city-state's urban development. Through examples on greenery, public spaces, security and inclusivity, he explains how Singapore's methodology has resulted in liveable city outcomes that are well-aligned with the Sustainable Development Goals.

Khoo Teng Chye

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The UN Sustainable Development Goal (SDG) 13 is climate action. What solutions has Singapore adopted in response to climate change and to plan ahead for its potential effects?

As a small nation-state with land constraints and limited natural resources, Singapore has always prioritised sustainable development. Climate change is an existential challenge for Singapore, and we have laid out mitigation and adaptation plans in the Singapore Climate Action Plan (2020) to address this.

Singapore aims to reduce carbon emissions with solar energy. Adoption of photovoltaic (PV) technologies is being encouraged through zero energy and Super Low Energy building schemes with the Building & Construction Authority (BCA). The Housing & Development Board (HDB) also consolidates public sector demand for solar panels across public housing blocks and government sites under the SolarNova programme. Some 5,500 out of 10,000 blocks have been identified for solar panel installations, and these blocks are able to achieve net zero energy consumption for the common areas. Singapore's national water agency, the Public Utilities Board (PUB), has begun test bedding floating solar PV systems on our reservoirs to make water treatment more sustainable, and hopes to work towards making Singapore one of the few countries in the world to boast a 100 % green waterworks system for water treatment.

Singapore is also preparing for urban floods by reviewing urban design regulations such as minimum platform level requirements by the Urban Redevelopment Authority (URA) and PUB. Under the Active, Beautiful, Clean Waters Programme, waterways such as the Kallang River at Ang Mo Kio Bishan Park use water-sensitive and nature-based solutions like vegetated swales and bioretention swales to not only mitigate urban floods, but promote biodiversity and provide a space for the community to enjoy.

As the national Coastal Protection Agency, PUB studies both coastal and inland flooding holistically and develops models to guide Singapore's flood protection response. Beyond efforts to study and ascertain the type, feasibility and extent of measures required to protect our coastal areas, PUB also partners stakeholders to identify new opportunities for urban development. For instance, we could reclaim a series of islands offshore, connecting these islands using barrages to create community spaces and contribute to water resilience.

How is Singapore tackling the problem of being a dense city in the tropics?

As an equatorial country, Singapore has inevitably relied on air conditioning. That said, there have been efforts to test out retrofits to achieve net zero energy, such as in the BCA Academy building. More recently, the School of Design and Environment at the National University of Singapore has a zero energy building with a hybrid cooling system, minimum air conditioning, ceiling fans and a passive building design to reduce energy consumption while producing energy through PV panels installed on roofs. With more research and development, improved building technology and vested interest to design passively well ventilated buildings will reduce reliance on air conditioning. Aside from architecture and built form, system based solutions such as district cooling will also help neighbourhoods share chiller capacity between buildings to enjoy cost benefits and optimised efficiency from economies of scale.

Greening is also a key strategy to ensure Singapore continues to be highly liveable. Greenery helps mitigate climate change, reduces the Urban Heat Island effect, makes our surroundings more attractive, and provides recreational areas. Being amidst nature will also enhance our health and well-being, and offer social bonding opportunities.

How is Singapore moving towards becoming a City in Nature?

Singapore's land constraints require us to be innovative to ensure that we maximise our space and make our shared spaces green and pleasant. We have set aside 7,800 ha of green spaces, and there are over seven million trees in these spaces and along our roadsides. The provision for greenery is built into our city's development plans to ensure that we green as we urbanise. For example, we require green verges on either side of new roads to be set aside for tree planting.

We want to take this approach even further as we aspire to become a City in Nature. First, we will dedicate 200 ha of nature parks by 2030 to protect our nature reserves from urbanisation. These parks will also allow our community to enjoy nature-based recreational activities such as hiking and bird watching.

Second, we will intensify nature in our parks and gardens, for example, by incorporating biophilic design and planting, and conserving more native flora and fauna. We will also naturalise more waterways and water bodies in gardens and parks, so that these can serve as floodplains to protect homes and properties from flooding while supporting biodiversity.

Third, we will continue restoring nature into urban areas. This includes encouraging more developers to incorporate skysrise greenery into their buildings and infrastructure, and greening up our industrial estates, which are among the hotter areas in Singapore.

Fourth, we will strengthen connectivity between Singapore's green spaces to sustain a healthy natural ecosystem. Multi-tiered planting creates a forest-like structure along our roads, which become Nature Ways that make our streets cooler and more comfortable for pedestrians, and are more resilient to the effects of urbanisation. We will also continue expanding the Park Connector Network, a network of green

corridors that link up our green spaces and parks. It is a great example of land optimisation – much of it is built over un-utilised spaces such as under MRT tracks, viaducts and along drainage reserves.

Singapore's journey towards becoming a City in Nature requires the support of the community. We have started to partner the community to plant a million trees across Singapore by 2030. We will also involve the community in the design, building, management and programming of more than 50 parks over the next five years. We hope to galvanise constructive community action towards caring for our living environment and making Singapore more liveable for everyone.

How important is public space, and how can they be encouraged as dense urban environments continue to develop?



Photo: iStock.com/primeimages

Marina Bay Waterfront Promenade has benefitted from the translation of urban design guidelines into architecture

Public spaces play a key role in cities by providing a platform for fostering social cohesion, generating social capital and improving security by bringing people together. At the neighbourhood level, the HDB ensures that public spaces such as markets, coffee shops, libraries, inter-generational playgrounds and exercise areas are well integrated amongst public housing blocks where people can forge social bonds outside the home.

Within government built projects such as town centres and housing estates, large plazas serve as gathering and events spaces at various scales. An example of this is Bedok Town Square. Located at the heart of the Bedok Town Centre, this partially sheltered plaza features a high ceiling and is equipped with industrial fans, urban furniture and power points, making it flexible in use and ideal for holding community events.

While government funded and inter-agency efforts have progressively incorporated community centered public space into their designs, the greater difficulty is in encouraging the private sector to develop such spaces. In this regard, the Gross Floor Area exemption schemes in the URA's Design Guidelines and Good Practice Guide for Privately Owned Public Spaces create economic value in designing buildings with publicly accessible communal spaces. The plaza at Paya Lebar Quarter is often activated by live performances and carnivals, bringing the public into an otherwise exclusive private commercial development.

Additionally, urban design guidelines also institute thresholds for public space in private developments. Setback controls, building height and building edge are just some tools to ensure that the public realm in prime areas in the city remain convivial. For example, Raffles Place Park and Marina Bay Waterfront Promenade are public spaces that have benefitted from the translation of such urban design guidelines into architecture. Beyond individual developments, urban design guidelines also help to connect these public spaces in an accessible and coherent way through five-foot ways, covered walkways and through block links to promote create networks of public activity.

One of the commitments for implementing the New Urban Agenda is through multi level governance to include the people as well. How has the community been engaged as a part of the planning methodology and in monitoring urban development?

One of the principles of the dynamic urban governance component in the Singapore Liveability Framework is to "involve the community as stakeholders". For the development of Our Tampines Hub, a co-located community hub, the People's Association tapped on its grassroots and community networks to reach out to residents in the vicinity through surveys, focus group studies and house visits. This created a feedback process for government agencies to understand the needs and desires of the people in the area.

With respect to monitoring urban development, the recently rejuvenated Bedok Town Square features a pioneering HDB town square architectural design accompanied by a Town Plaza Activation Team comprising local community partners, schools, grassroots leaders and the National Arts Council. Through this team, HDB continues to involve the residents by organising regular events such as outdoor movie screenings, mass yoga sessions and performances. This institutionalises the belief that the new generation of town squares should not only be well designed architecturally but above all, should be inclusive.

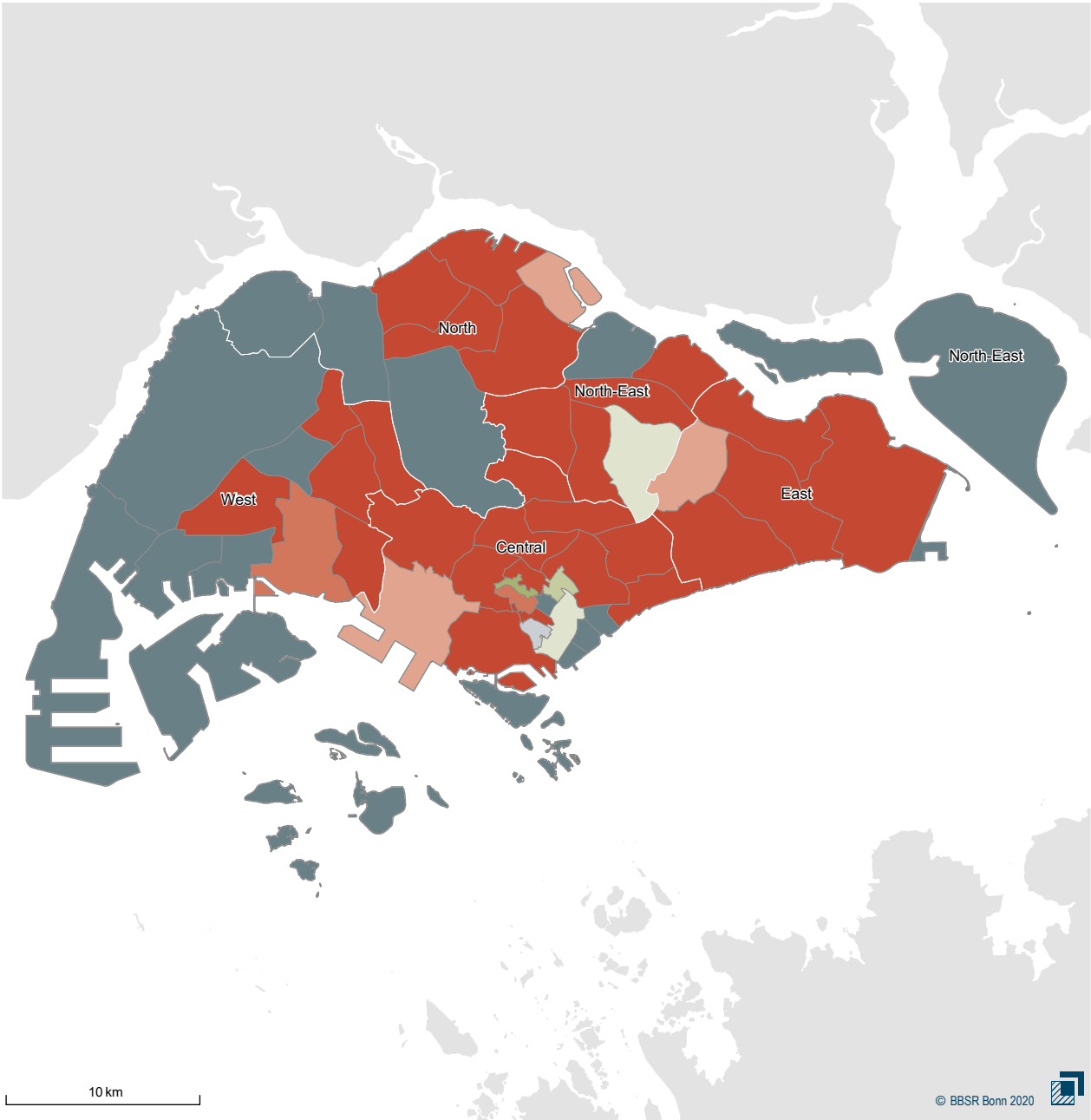
How can other cities translate these planning and governance initiatives to their own context?

As a small island city state, Singapore's land constraints and limited natural resources has always led us to prioritise sustainable development through good governance and an integrated approach to planning and development, an urban systems approach that is captured in the Singapore Liveability Framework. The framework provides practical principles for long term planning and urban governance, which work in tandem to achieve the liveable city that Singapore has become. The Centre for Liveable Cities also offers capability development programmes for local and international city leaders to encourage the application of these guiding principles into the specifics of their context.

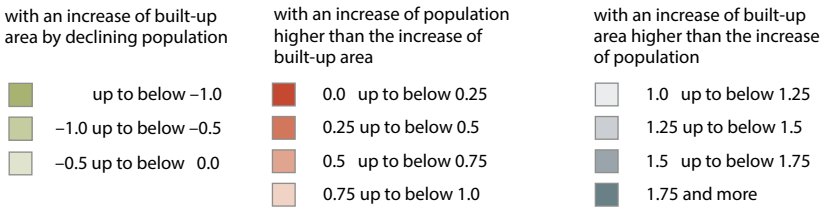
Even so, Singapore continues to face challenges and contingencies that we too need to prepare for. The recent COVID-19 pandemic has highlighted how unprecedented and unexpected future shocks may be. In this light, Singapore would need to continue to build even greater resilience to ensure continuous urban development.

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Development of built-up area in relation of population in Singapore



Ratio of the annual percentage change of built-up area and population change between 1990 and 2014



Source: Spatial Monitoring System for Europe
 Origin of data: Global Human Settlement Layer
 Administrative data: Data.gov.sg; GADM
 Territorial units: Planning Areas
 Author: V. Schmidt-Seiwert