

# Skyline

Insights into planning spaces around us

## Moving goods

We look at innovations and new ideas in urban logistics

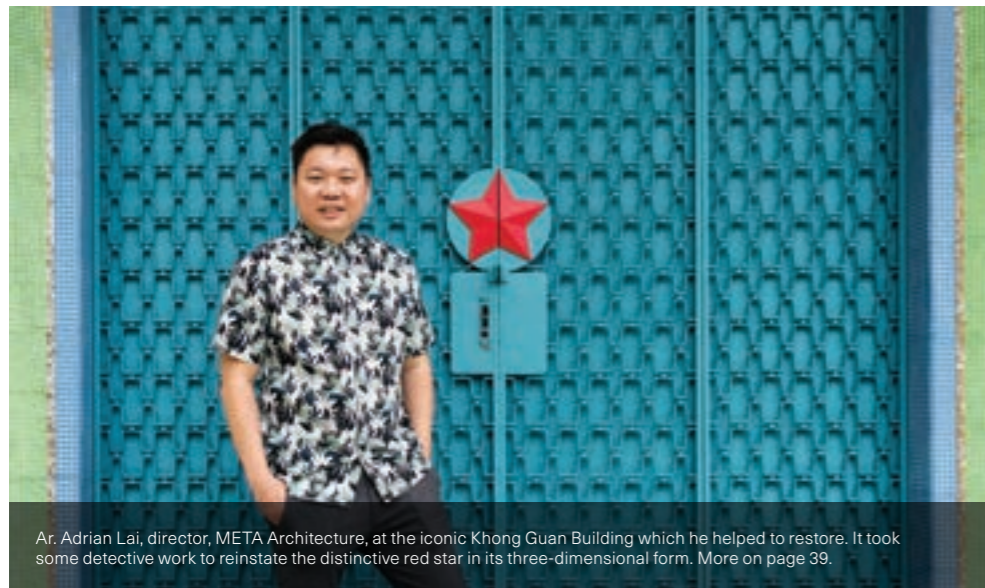


Is Singapore a biophilic city?

New ways to beat the heat

How to create inclusive cities

# Skyline



Ar. Adrian Lai, director, META Architecture, at the iconic Khong Guan Building which he helped to restore. It took some detective work to reinstate the distinctive red star in its three-dimensional form. More on page 39.

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# Making cities work

“You cannot care about what you do not know,” says Dr Lena Chan, one of Singapore’s leading conservationists. In driving various efforts in Singapore as a biophilic city, Lena stresses the need to develop a deeper understanding of our natural assets. She is one of the many who are shaping and redesigning environments and systems for cities to thrive.

In this issue, researchers, experts and designers show us new ways to green the city, beat the heat and manage goods deliveries. They also show us the importance of good design for cities.

Part of making our cities work is in building up our knowledge base and capabilities. The latest Cooling Singapore project’s multidisciplinary approach enables it to not only identify knowledge gaps to address the urban heat island effect in Singapore, but have also reached out to government agencies and more than 2,000 citizens, making the findings more relevant and relatable to every individual.

It is also about changing mindsets and behaviours. Amongst the various urban logistics solutions, Vincent Phang, chief executive officer at ST Logistics wants us to change the way we view time to consider deliveries that can be scheduled differently at night or during off peak hours. This also means consumers need to change their behaviours to receive goods round-the-clock.

For cities to continue to flourish, designers and planners are also demonstrating what good design can do for streets, infrastructure and even services. Former Toronto chief planner Jennifer Keesmaat is redesigning streets that focuses on pedestrians. LOOK Architects’ elevated walkway in Fuzhou has become a catalyst for people-centric public spaces.

And design consultancy fuel for is tackling indifference that caregivers face with wide-ranging solutions, advocating for designers to create more compassionate and sustainable societies where people can play a role in shaping their world.

Indeed, it takes all of us to make our cities work. We hope this issue inspires you to continue to rediscover the city and play your part in contributing to the many initiatives and efforts that make our living environments better.

# 452 BILLION

In 2017, Singapore imported S\$452 billion worth of goods. With the rise of on-demand deliveries and new technologies, experts and policy makers are finding new ways to transform the way goods are moved quickly and efficiently throughout the city.  
Source of figure: Singapore Department of Statistics

**“Who do we want to use this street and how can we ensure the safety of all users, especially the most vulnerable ones?”**

Former Toronto chief planner Jennifer Keesmaat on the idea of “complete streets” where instead of designing streets based on how to move cars as quickly as possible, she suggests that it should begin with understanding how people want to use the streets.

**“I hope our communities relearn to live and reconnect with nature because that is the best way for humankind to live sustainably.”**

One of Singapore's leading conservationist, Dr Lena Chan, on what she hopes Singapore's biophilic efforts will achieve.

**“Singaporean architects have produced a remarkable portfolio of innovative designs... and they have enriched the vitamin pool of contemporary architectural language.”**

Professor and architect Li Xiaodong reflects on the innovation and revolution of contemporary architectural works in Singapore in the last 15 years, presented in URA's new book, *Contemporaneous Architecture*, that will be published by March 2019.

# 10

The Tianjin Eco-City celebrated its 10<sup>th</sup> year anniversary in 2018. A front runner in eco-city development, it continues to thrive and lead in sustainable development. It is the first eco-city in the world that uses a comprehensive set of 26 major performance indicators to guide its planning efforts.

# 2000

The Cooling Singapore project engaged more than 2,000 Singaporeans through social campaigns to study the relationship between climate, urban space and people. “Our research wouldn't be complete if we aren't reaching out to people,” says Project leader Dr Heiko Aydt.

## More reasons to make places greater

Place-making efforts are gaining momentum in Singapore with 9 new precincts piloting URA's Business Improvement District (BID) programme.



Place-making, a coordinated, multi-stakeholder approach to improve districts has become increasingly important for cities in creating lively streets and sustaining vibrant districts. Efforts in this area have gained momentum with stakeholders from 9 precincts coming forward to participate in the pilot BID programme launched by URA in September 2017. The precincts are China Place, City Hall, Jurong Gateway, Kampong Gelam, Marina Bay, Marina Centre, Paya Lebar, Raffles Place and Tanjong Pagar.

Minister for National Development, Lawrence Wong, at the announcement of the 9 precincts piloting the BID emphasised the importance of place-making especially in response to changes in the digital and retail landscapes. “We need place-makers to turn generic spaces into authentic experiences that can engage people and make them want to spend time, and come back again. Successful place management

can also bring the community together, and help to develop shared memories and build meaningful connections. That is the key, also, in making our city special, distinctive and endearing – both for Singaporeans as well as our visitors,” he says.

Precincts selected to participate in the pilot BID programme are required to develop detailed business plans and get at least 51 per cent support from stakeholders within the defined boundary in their respective precincts to go on to form pilot BIDs. The government will then provide dollar-for-dollar matching for the membership fees collected by each pilot BID up to a cap of S\$500,000 per year, for the first 4 years of the pilot BID programme. URA will also work closely with the stakeholders in developing business plans for their precincts.

Above | Precincts are attracting communities with lively festivals such as the Kampong Gelam Day Out on 24 November 2018 (image on left) and vibrant public spaces like the Urban Park at Tanjong Pagar Centre (image on right).  
Photo credit: One Kampong Gelam and GuccoLand.

# Redesigning cities for people

Toronto's former chief planner Jennifer Keesmaat is redefining the use of streets and the way residents are engaged to create more inclusive cities.

Writer **Jennifer Eveland**



In a world inundated with more complex urban challenges, Jennifer Keesmaat is hopeful. Toronto's chief city planner from 2012 to 2017, Jennifer has taught at the University of Toronto, served as chief executive officer of a non-profit organisation established to create affordable urban rental housing, and has even run for city mayor.

"My work is about demonstrating that we can overcome constraints of the past," says Jennifer. "In this era of uncertainty around our climate, human migration, displacement, growing radicalisation and exclusion, building cities that are sustainable and for everyone is a fundamentally hopeful act."

## Tackling challenges through urban renewal

Optimism may seem easy in a city that is consistently voted one of the world's most liveable, yet Toronto, Canada's largest metropolis by population, faces problems common to many cities, such as homelessness and lack of affordable housing, economic and ethnic segregation, and general apathy, to name a few. Where Toronto falls short, urban renewal seeks to address the hard issues.

"Urban renewal, at its centre, must be about creating cities that are increasingly inclusive and open to cultural diversity, entrepreneurialism and mobility choices," says Jennifer. "At the heart of that is access to safe and affordable housing."

In this context, one of Toronto's finest examples of urban renewal is the downtown St. Lawrence neighbourhood. Built in the 1970s on former industrial land, the city-funded housing project introduced a new built form typology – midrise – into the landscape of a city that was otherwise dominated by dual extremes of urban sprawl and point towers.

Anchoring the neighbourhood is a linear park that is constantly in use and surrounded by schools, community service facilities and housing built to accommodate residents across the economic spectrum. In the 4 decades since the neighbourhood's establishment, data gathered

on the residents of St. Lawrence indicate that the project has overwhelmingly succeeded in lifting its poorest residents out of poverty, what Jennifer believes is due in large part to the precinct's balance of high-density and mixed-use environments.

## Determining the right density

"From a planning perspective, you can say that the right amount of density is 'x number of units per acre', but from my perspective it's more important to ask how we are providing the right amount of density to create liveable, walkable communities with a mix of uses, while at the same time not compromising any of our quality of life drivers," says Jennifer.

Above | The David Crombie Park in Toronto's east downtown serves as a green spine of the St. Lawrence neighbourhood. The park was designed as an integral part of the neighbourhood which has been successfully transformed from an industrial area into a lively, diverse residential and commercial hub. Photo credit: City of Toronto.



In terms of the mix of uses, Jennifer says it's critical to ensure that we're designing cities in such a way that activities undertaken often and repeatedly can be done within walking distance of home. "When we talk about getting the mix of uses right, it's about providing those amenities that are needed to support everyday life."

A cautionary example she shares is the trend in North America to separate schools from community life, either due to education systems that send children to schools outside of their communities or because planners stopped designing neighbourhoods around them.

### Redefining the use of streets

Principles of density and mixed use don't only apply to neighbourhoods but to streets as well. Jennifer describes "complete streets" based on the idea that streets can be designed to accommodate multiple users such as people who walk, cycle, take transit or drive, as well as multiple uses like sidewalk cafés, benches, greenery and shade, lighting, utilities and stormwater management. Whereas previously, the old street design model asked "How can we move cars through as quickly as possible?" she suggests that the redesign process begin by asking, "Who do we want to use this street?" and "How can we ensure the safety of all users, especially the most vulnerable ones?"

"It's fundamentally a counter to the approach that was used in the past, and I would even argue it's the opposite, because in order to prioritise making all users safe, invariably, you're going to have to move cars more slowly," she says.

Toronto faced the challenges of going car-lite in 2017 when it redesigned King Street, a major commercial thoroughfare in one of the city's densest and most congested areas. The move limited vehicle access and prioritised public transit and pedestrians, resulting in faster streetcars or trams and more versatile use of curb and sidewalk space.

One of the biggest challenges was getting public opinion on board. "It's actually a philosophical issue that a community or a city has to go through whereby they start to rethink and reposition what streets are for," says Jennifer. "In order to make a city that's designed for pedestrians, you do have to confront and wrestle to the ground the role of the car in the city."

### Finding new ways to engage residents

To garner public support for planning projects, the city has established a number of innovative strategies that go above and beyond traditional public meetings. Planners in Public Spaces, or PIPS, is a programme that started in 2013 to send planners out to various areas within the city to engage people in these places who wouldn't



normally attend public meetings, which Jennifer says tend to be dominated by those who already feel empowered by the planning process. PIPS proved to be an enormously successful way to approach community consultation.

Another initiative is the Planning Review Panel (PRP), the first of its kind in the world. Launched in 2015, the PRP is a 32-member advisory panel made up of resident volunteers selected via a random civic lottery. Panel members represent the diverse demographics of city residents with regards to age, gender, race and homeowner status to ensure a variety of perspectives and input that are representative of the diverse interests that exist in the city. Over the span of 2 years, the panel met 16 times to learn about city planning issues and offer their viewpoints and produced reports on their recommendations.

Both PIPs and the PRP were initiated during Jennifer's tenure as chief city planner, and it's what she says excites and motivates her most about her work. "I'm engaged every day in collaborating with people who believe that we can, through the design of our cities, overcome some of the greatest challenges of our time."

*As the former chief planner for the City of Toronto, Jennifer Keesmaat creates places where people flourish. Over the past decade, she has been recognised by institutes such as the Canadian Institute of Planners and the Ontario Professional Planners Institute for her work in municipalities across Canada with a variety of awards for planning excellence. Her work is focused on the creation of complete communities, the facilitation of collaboration across sectors and engagement with residents, municipal staff, business leaders and other stakeholders. Jennifer is also a member of URA's International Panel of Experts.*

Above and opposite | The ongoing King Street transit pilot is giving priority to streetcars or trams over private vehicles and is offering opportunities to create delightful public spaces. Photo credit: City of Toronto.

## A GREAT CITY: 8 PRINCIPLES

Jennifer Keesmaat shares 8 timeless urban principles of a great city.

### 1 Design places and streets for people

The world's greatest cities – Paris, Rome, Barcelona or New York – are transforming their streets into avenues for people as opposed to cars. Many streets were designed for moving cars, but in doing so we've removed the places that are central to community life – streets where people linger, and interact; streets that are the heart of local commerce; streets that are walkable, enjoyable destinations.



Times Square, New York. Photo credit: NYC Department of Transportation.

### 2 Have neighbourhoods with amenities close by

When neighbourhoods have amenities in close proximity, it is possible to undertake much of your life within walking distance or a short transit ride of where you live. A local main street might provide the option of walking to the doctor, to the hairdresser, or to buy a gift for the birthday party next door. It is a fundamentally different way of life from that of neighbourhoods comprised only of housing.



Queens Quay Boulevard, Toronto. Photo credit: City of Toronto.

### 3 Enable people to have many options for getting around

To provide options for movement, it is essential to embrace complexity and to design streets and buildings intentionally. By designing buildings to be oriented to pedestrians, and by designing streets to accommodate multimodal use (private vehicles, transit, and bikes), we can provide people with options for getting around, and over time, we will see a diversity of users.



A neighbourhood in Singapore showing various mobility options.

### 4 Create a critical mix of uses, in proximity

This principle is about capitalising on synergies and density, and ensuring that the intensity and complexity of use contributes to the vibrancy of a place. Building denser, mixed use communities also makes better use of expensive infrastructure. In single-use suburban residential communities, most of the infrastructure is unused all day long. It is important to note that having many uses together does not necessarily mean creating high-rise towers. Some of the densest cities in the world are mid-rise.



Marunouchi, Tokyo.

### 5 Focus on the public space

Great cities have great public realms, and the quality of our public spaces says something about the places we value. It is a way of making contributions to civic life by adding inspiration, and it is a way of signaling who belongs in the public space.



Campo Sanita Margherita, Venice. Photo credit: Gehl Architects.

### 7 Value clean land, air and water

Our cities, increasingly, are the habitat that sustains us. Great cities remember this, and treat land, air and water as the precious resources that they are. It may seem counterintuitive, but we know that the denser our habitat, and the extent to which we have transportation options, the lower our ecological footprint.



Learning Forest, Singapore Botanic Gardens.

### 6 Preserve and restore heritage

Heritage preservation contributes to a city's distinct identity, creates character, and can be a key driver of economic development. Great cities maintain a connection to their past, adapting heritage buildings for new and innovative uses. As Jane Jacobs, author of *The Life and Death of American Cities* wrote, "New ideas need old buildings."



The Great Madras, Little India District, Singapore.

### 8 Plan for affordable housing

It is a catch-22 for cities that as they grow, their affordability declines. Great cities must plan for affordable housing options that are integrated into the most urban, desirable places to live – the same neighbourhoods that provide options for movement and walkable amenity.



HafenCity, Hamburg. Photo credit: Thomas Hampel/EBBE&FLUT.



## Moving goods

24/7 automation, mindset shifts, changing the contexts – Vincent Phang, the chief executive officer of ST Logistics discusses the challenges and solutions of moving goods quickly and efficiently throughout the city.

Writer **Jennifer Eveland** | Photographer **Chee Boon Pin**

In the future, as more people move into the world's cities, an increasing number of goods will end up in cities as well, and with game-changing revolutions in online shopping and globalisation, the number of deliveries only stands to grow. Amid these trends, cities are tasked with finding solutions to ease traffic congestion and reduce pollution and other unwanted externalities while promoting economic growth, competitiveness, quality of life and sustainability.

In 2016, the Logistics Industry Transformation Map was launched to strengthen Singapore's position as a leading logistics hub and the logistics industry digital plan was released in 2018 to guide local small and medium enterprises to capitalise on digital technologies to enhance logistics solutions.

While a lot of attention has been given to technological solutions such as drone deliveries and driverless vehicles, innovations in business models and urban infrastructure are set to usher in a new mindset around how we as consumers, urban residents and policymakers will see goods moved from factories into our businesses and homes.

Large volumes of trucks move around the city everyday.



## 452 billion

In 2017, Singapore imported S\$452 billion worth of goods. These goods make their way to consumers and businesses. *Source: Singapore Department of Statistics*

## 142,800

There are over 142,800 vehicles in Singapore, making up 15 per cent of the total vehicle population. *Source: Land Transport Authority*

## 2X

On average, a goods vehicle travels 2 times the distance of a private car. *Source: Calculated based on Land Transport Authority, Statistics in Brief and annual vehicle statistics.*

Urban logistics faces a more daunting set of challenges than global logistics, according to Vincent Phang, chief executive officer at ST Logistics and executive vice-president for Global Logistics in Singapore at Toll Group, part of Japan Post Holdings, a global transportation and logistics company. "Distance can mask some of the inefficiencies in logistics," he says. "In large countries with large distances, some of the details around utilisation and productivity may not stand out as starkly as it does in an urban setting. For cities, it's amplified."

Few scenarios underscore the importance of urban logistics quite like the medical supply chain, according to Vincent, when not a moment can be spared in delivering life-saving supplies at a precise level of quality. When time is of the essence, the complexity of urban logistics systems and the problems involved in getting goods from point A to point B are intensified. For medical deliveries, Vincent adds it's easy for his company to provide a dedicated fleet on constant standby with personnel working around the clock. The challenge is in sustaining that level of operations across the board.

"These days, consumers expect instant gratification. When we buy something, not only do we expect it to be delivered as soon as possible, we also expect to be able to track where that delivery is at any time through its supply chain," he says.

There's no shortage of companies willing to take up the gauntlet. With a low barrier to entry, Vincent estimates approximately 5,000 logistics firms in Singapore – smaller players running fleets, warehouses and local small- and medium-sized enterprises – but he sees that number consolidating, with more players thinking about future directions in direct-to-consumer, last-mile-type of deliveries. For these companies, Vincent believes their focus is likely to be on last mile logistics as it accounts for about two-fifths of the overall delivery costs.

Likewise, for cities, freight vehicles contribute to urban traffic emissions and can hog up the road capacity. Innovations in last mile logistics can have a tremendous improvement on both industry and government.

If there is an industry solution that connects people at any point throughout the day, that would truly change the game for a small country like ours.







### Time is of the essence

In Singapore, Vincent sees latent capacity and resources that are not immediately obvious.

“We could start by looking at innovation in a different way,” he says. “It’s not always about implementing technology to optimise things in the current construct. Perhaps we should invest in innovation that helps us change the construct itself.”

One such construct is time. The entire country, he says, revolves around the idea of peak hours created by the beginning and end of work shifts, school days and business operations.

“We have data around how our fleets and warehouses are working,” says Vincent. “We can plot it to see how

the spikes correlate, but I wonder could there be a better way to stagger things, especially given our constraints in resources like land and assets?” He believes that perhaps government and industry can work in tandem to redefine work shifts and schedule deliveries to hospitals and business during the wee hours of the morning.

This would also require a mindset shift in customers with regards to how they receive deliveries.

“Can consumers receive goods round-the-clock at home?” he asks. If there was a way to change or incentivise certain behaviours, Vincent believes we will start to see the implementation of productivity improvements that are more industry-wide as opposed to piecemeal.

### 24/7 automation

Improving productivity is an area that Singapore is constantly grappling with, says Vincent.

“My take is we have to strive toward a mechanised future to intensify every productive hour that we have,” he suggests. “For example, in our warehouse, if we automate, which is where I think that government would like us to invest, we would have to run the machines around the clock so that there are no surges, no shifts. That would also have to be matched by a distribution system that is also operating around the clock.”

Vincent views assets in a different way. “In a truly efficient logistics system, supply chains would be optimised to the level that warehouses could potentially be very much reduced. The footprint for storage would be very much lesser if we have a smooth ability to plan supply chains from point to point, then truly there’s no need for an intermediate storage like a warehouse.” He believes that in an urban setting, it is worth considering whether or not we should invest in real estate at this level. “Maybe operating in a more consolidated and synergistic manner without warehouses and fleets would drive the next level of innovative development.”

Perhaps things could change, he adds. Vincent believes there is far more capacity in Singapore especially being a city that never sleeps. For example, there is low capacity at 2 o’clock in the morning where consumers are not demanding solutions and businesses are not structured to utilise that low capacity. There are opportunities around this. To make better use of underutilised resources, night deliveries could be planned with lesser parties competing for the use of the same infrastructure such as roads and loading bays.

In addition, Vincent also suggests a co-sharing business model could be explored where supply (vehicles) and demand (goods delivery) are made available. “Other than being proprietary to certain companies if there could be some kind of crowd sourced capacity...and how could we actually fire up that capacity to ensure that the solutions for the future aren’t just locked to any specific user or any specific company, but rather be inter-operable and be transparent in a way that an entire industry can access relevant information.”

### A glimpse of the future

“Access to data is certainly pervasive and levels the playing field, however translating that data into an actual efficient delivery system, that’s still being worked on, with the goal to make deliveries within a few hours,” says Vincent, adding, “I think we’re not quite there yet.”

“Just looking at the crystal ball, Singapore is probably the most digitally connected nation in the world. If we can get around the sensitivities of some of those digital connections and start to look at the entire nation, knowing where everyone is because of our mobile devices, then we can make deliveries in the most efficient manner,” says Vincent.

“If there is an industry solution that connects people at any point throughout the day, that would truly change the game for a small country like ours.”

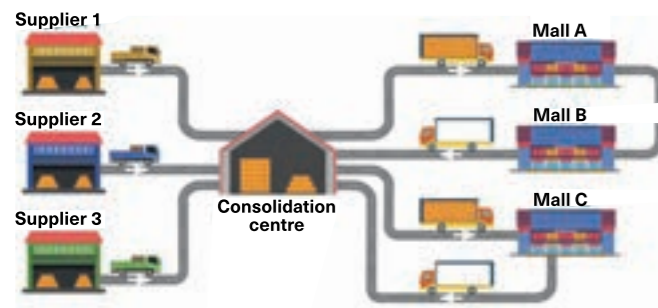
While Vincent believes reaching a true urban logistics nirvana is all down to innovation, he is careful to distinguish that innovation is not always about technology. “I think innovation in the true sense of the word,” he says, “is to change people’s behaviour and what we have right now.”

Above | Since adopting VersaFleet’s software-as-a-service in 2018, Reliable Transport & Logistics Services has reduced the time spent on operational planning by 75 per cent.

**Without consolidation centre**



**With consolidation centre**



Above | Illustrations to show the benefit of off-site consolidation centres that can help better organise deliveries and an overview of real-time visibility of operations from different players' perspectives.

**INNOVATIONS IN URBAN LOGISTICS**

Emerging solutions and new ideas to address the urban logistics systems in Singapore are presented in the seventh instalment of URA's Urban Lab exhibition series, "Delivering Together: Transforming Urban Logistics", from 4 December 2018 to 15 February 2019 at the URA Centre.

Here are 6 ideas featured at the exhibition:

**1 Consolidation:** Instead of having many individual trucks drop off small items each time at shopping centres and food outlets, how about channeling deliveries to an off-site consolidation centres and ensuring trucks are at full loads or well utilised when they reach malls or food outlets? Such off-site consolidation centres are piloted by Enterprise Singapore with several delivery companies for the retail and food services. One of these companies, AAK Logistics, has helped their customers save 15 to 20 per cent of their logistics costs through such consolidation.

**2 Common points:** Another way to enhance delivery efficiencies is to create a common district dispersion point (DDP) for buildings within an area to receive deliveries at a shared dock where goods are then redistributed to each building. DDP has been successfully implemented in countries such as Japan and Australia. In Singapore, this idea is being explored for the Punggol Digital District and other areas.

**3 Scheduling:** Technology can be tapped on to better manage deliveries. Global company Gurusoft's Dock Scheduling & Queue Management (DSQ) system provides real-time visibility of loading bay availability and facilitates timeslot bookings. A pilot of DSQ at Tampines Mall showed a significant reduction in queuing time. It is also being implemented in Fusionopolis One @ one-north and Changi Airport Terminal 4.

**Without DDP**



**With DDP**



Above | Illustrations to show possible delivery routes with and without a district distribution point (DDP). Having a common point in an area for buildings can enhance delivery efficiencies.

**4 Friendly pick-ups:** Even residents can play a part. Local start-up Park N Parcel uses residential homes as collection points. Residents, referred to as 'parkers', earn a small fee to collect and hold the parcels until their neighbours are free to pick them up. Park N Parcel currently has more than 1,600 parkers islandwide, comprising homes and shops, processing more than 1,000 parcels daily.

**5 Doing more efficiently:** 100 unique tasks. Limited store operating hours. Varying drivers' working shifts. How can operators plan deliveries in the most efficient way? Transport management softwares can potentially help to better manage deliveries and support other innovations such as dock scheduling.

Local start-up VersaFleet put seasoned logistics personnel to the test in 2017. While the best team completed the exercise manually in 1.5 hours, VersaFleet's optimisation algorithm took less than 1 minute.

**6 Night deliveries:** The night is young, and the roads are empty. Night deliveries can offer quicker, smoother deliveries. AAK Logistics collaborates with various retailers to deliver goods after operating hours. As there are no staff to receive the goods, the delivery personnel are given the keys to enter the premises and place the goods in a dedicated space in the shop.

Autonomous Mobile Robots (AMRs) such as TUG by Aethon, an ST Engineering subsidiary, can take night deliveries to the next level. It is able to navigate autonomously through the building to bring deliveries from the loading bay to the shop, and communicate with smart locks to ensure security. They can also carry heavy loads and are already being used in healthcare, manufacturing and hospitality sectors.

For more information about the exhibition, go to <http://ura.sg/urbanlogistics>.

## Is Singapore a biophilic city?

One of Singapore's leading conservationist, Dr Lena Chan discusses what it means for cities to be biophilic and reminds us that the best way to live sustainably is to reconnect with nature.

Writer Dawn Lim | Photographer Chee Boon Pin

“We have actually been a biophilic city all these while,” says Dr Lena Chan, senior director, International Biodiversity Conservation Division, National Parks Board (NParks) on the shift in focus towards Singapore as a biophilic city in the recent years. “A city does not turn biophilic on a planned day. Like all things natural, it evolves. All the efforts moving Singapore from a garden city to a city in a garden were actually leading us up to a biophilic city. We always had the DNA in us to be green and the principles were already in place. We simply added elements as we went along and became more and more biophilic,” she explains.

Lena has been working tirelessly behind the scenes for decades to protect and enable plants and animals to thrive in Singapore, managing a delicate balance between conservation and urban development. We catch up with her at the Singapore Botanic Gardens' Learning Forest on why cities need to embrace nature and why individuals all need to relearn and understand what it means to see, feel and experience the rich nature all around us in every part of our lives.

#### **How are biophilic cities different from green cities?**

Originating from the word 'biophilia' (which means 'loving living things'), biophilic cities live in harmony with nature. Multidimensional with multiple plant species that support other species of animals and living things, they are a rich mosaic of forests, gardens, streams and marine environments linked by ecological corridors. Even their built infrastructure and buildings are biodiversity-friendly.

As a result, these cities have more liveable, sustainable and resilient urban communities. They understand the benefits of connecting with nature, and what natural ecosystems bring to physical, mental and psychological health.

#### **Will every biophilic city turn out looking the same?**

Depending on the kind of species that thrive in the city, coupled with cultural factors, each city will have its own special connection with plants and animals, and therefore their own biophilic interpretation and expression. Singapore's biophilic narrative might be closely tied to our food culture, for example. Since biophilic cities also have an element of 'I'm involved and I want to make it work', it is very important that the general public connects with the narrative.

#### **Achieving a successful biophilic city is a large-scale effort. In Singapore, who are the stakeholders and parties involved that are particularly important?**

A biophilic city is extremely comprehensive so it is difficult to create a successful one if efforts are approached in a piecemeal manner. It is not a single purpose. Everyone is a major stakeholder. Every government agency should be involved, collaborating and cooperating synergistically with the private sector, academic institutions and the public to create, design and sustain a biophilic city.

#### **NParks has introduced biophilic design typologies, such as the Learning Forest at the Singapore Botanic Gardens. Why are these typologies important?**

As Singapore becomes more urbanised, it is essential that our infrastructure (besides natural reserves, parks and roadsides) should also feature natural elements. These biophilic design typologies are important because they ensure the principles of biophilia and ecology are consciously and intentionally incorporated into our infrastructure and included right from the beginning.



Above | Dr Lena Chan at the canopy web at the Singapore Botanic Garden's Learning Forest (image at the top) that is part of the biophilic efforts. The 10 ha forest is home to 120,000 plant species.



**The Natural Capital Singapore study, which you are also involved, is an important project in our biophilic efforts. Why was there an incentive to formalise a study?**

We need to move away from the mindset that Singapore does not have natural resources. Our rich biodiversity needs to be a part of our national assets and story. To identify what we have, the Natural Capital Singapore study was set up to quantify Singapore's natural assets, define our most important ecosystems and develop tools to aid biophilic design in urban planning.

Any biophilic urban planning and design need to incorporate the natural capital at the early decision-making stage. However, unlike economic benefits that are easier to calculate, we currently lack a comparable framework that systematically accounts for Singapore's natural capital.

Upon recognition that the natural environment is an important component of the economic performance and liveability of a city, a multidisciplinary research team – comprising principle investigators from different institutions and various science and social studies disciplines – was needed to assess the status of Singapore's major ecosystems and quantify the value of the services provided by these ecosystems.

In a way, putting a dollar value to something will make us more aware of its true value. This study will let us know the true functions and benefits of our ecosystems.

**What is an interesting problem that the study is tackling?**

The translation of biodiversity values into the language of economists and financiers. Several indicators in the Singapore Index on Cities' Biodiversity provide quantitative scores that can be innovatively converted into values that are understood by this group of stakeholders.

I hope our communities relearn to live and reconnect with nature because that is the best way for humankind to live sustainably.

We have reached a stage of maturity where we have accumulated an immense amount of data and knowledge on Singapore's diverse ecosystems. But we now need to develop the vocabulary that will help connect our ecosystem services with the current economic system.

**How much of Singapore's natural assets do we understand at this point?**

We have much more to learn about our natural assets, the ecological interdependencies, as well as the genomics of our biodiversity. Our plants are rather well-documented. A reasonable amount of biodiversity data has been collected, especially on taxonomic groups like flora, mammals, freshwater fish and spiders. However, we know very little about our soil organisms.

We also need to understand the demand for ecosystem services specific to different groups of people. Natural Capital Singapore would be a first step in holistically consolidating and analysing all information for national assessment and analysis.

**The public and schools are also encouraged to participate in research through citizen science programmes. What is the significance of extending research efforts into the larger community?**

You cannot conserve what you do not care about. You cannot care about what you do not know. So, it is important for people to be more engaged in

learning. Also, our researchers can't spend 24-hours a day doing biodiversity surveys, but people are everywhere – they can help by exploring and discovering the amazing biodiversity out there that is making a difference to the quality of their lives.

For our citizen scientists, NParks created the SGBioAtlas app, which connects to a biodiversity database that allows anyone to reference, document and contribute to the database.

**Do we have to choose between urban development and green-and-blue conservation? Are they mutually exclusive?**

Both conservation and development should be done for the human good, so I don't think they are incompatible if biodiversity conservation is incorporated into urban development. Biophilia should help merge conservation and development into a sustainable process.

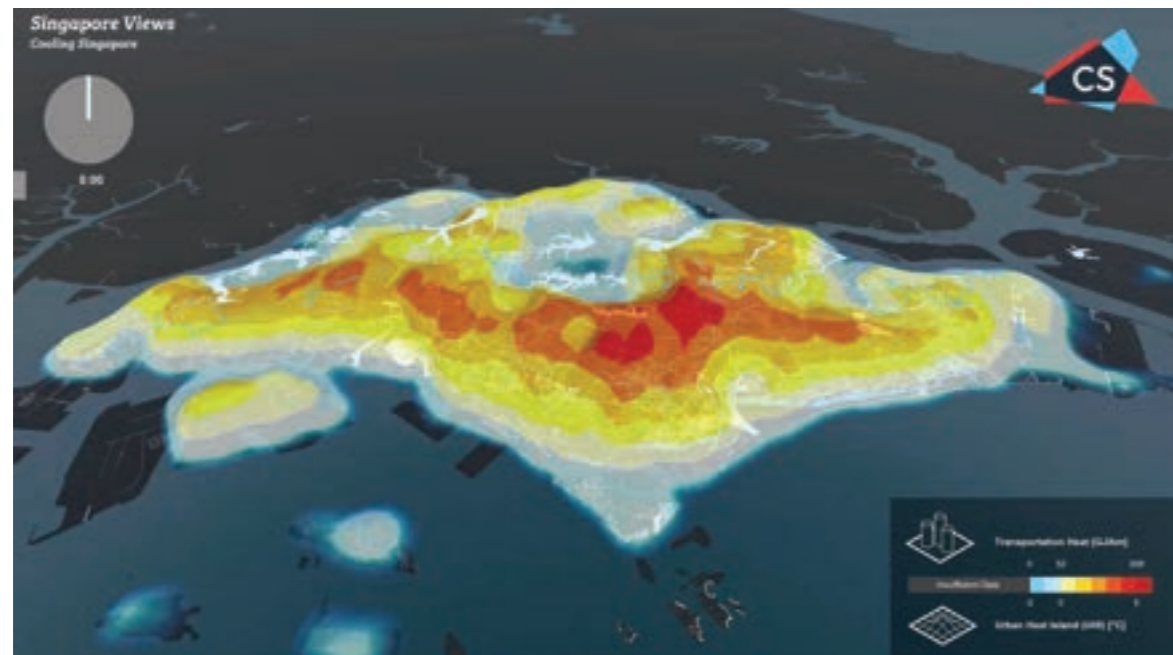
**Where do you hope our biophilic efforts will lead us?**

It is very difficult to cast an eye on the crystal ball because of so many external factors that are beyond our control. However, I hope that by intensifying, strengthening and broadening our biophilic efforts, it will build up Singapore's adaptation, mitigation and resilience to climate change. I hope our communities relearn to live and reconnect with nature because that is the best way for humankind to live sustainably.

# Ways to beat the heat

The latest Cooling Singapore study is finding new ways to keep Singapore cooler and everyone can play their part.

Writer **Jennifer Eveland**



Climate scientists calculate that by the end of the century, the temperature in Singapore will have risen by anywhere between 1.4 to 4.6°C<sup>1</sup>. Meanwhile here in tropical Singapore, where the hottest day on record was a scorching 37°C<sup>2</sup> (degree celsius), researchers are working on a project to understand how we experience heat locally and what we can do to cool our city.

What they're studying is the Urban Heat Island effect, or UHI, the degree to which our urban built environment is hotter than neighbouring rural areas.

In 2006, assistant professor Winston Chow and professor Matthias Roth from the National University of Singapore (NUS) reported<sup>3</sup> that the UHI in Singapore can be as high as 7°C.

Since January 2017, researchers in the Cooling Singapore project have been mapping temperatures across Singapore – from forests to industrial parks, the Central Business District and housing estates – to better understand the extent of the UHI effect in Singapore. They have also identified knowledge and technology gaps, and have established a task force

with government experts. The aim of this project is to develop a roadmap for developing the capabilities needed for Singapore to regulate its urban climate.

The project, funded by the National Research Foundation (NRF)'s CREATE programme, is led by the Singapore-ETH Centre – a collaboration between ETH Zurich and NRF – and brings together researchers from the Singapore-MIT Alliance for Research and Technology, the Technical University of Munich, and NUS.

## Causes of heat

Project leader Dr Heiko Aytz explains that there are 2 main causes for Singapore's UHI. The first is incoming solar radiation, which heats up roads and buildings, with this stored heat being slowly released back into the environment. The second is the heat that is actively emitted by motor vehicles, power generation plants, industry and even household appliances, including ironically, air-conditioners.

UHI isn't the only heat-related metric the project aims to quantify. It also seeks to assess how people experience this heat, which entails measuring their Outdoor Thermal Comfort (OTC).

Project coordinator Dr Conrad Philipp describes OTC as a condition of mind that expresses satisfaction with the thermal environment. "It is a complex condition to assess because it depends not only on environmental factors such as humidity, temperature and wind speed, but also on more subjective attributes such as a person's outdoor exposure, current activity and past experience in different environments."

While measured in different ways, the two metrics are obviously related – as UHI goes up, OTC goes down – though the exact correlation between them is difficult to establish.



<sup>1</sup> Source: National Climate Change Secretariat. <https://www.nccs.gov.sg/climate-change-and-singapore/national-circumstances/impact-of-climate-change-on-singapore>

<sup>2</sup> Source: Meteorological Service Singapore. <http://www.weather.gov.sg/climate-historical-extremes-temperature>

<sup>3</sup> Chow, W.T.L., Roth, M., 2006. Temporal dynamics of the urban heat island of Singapore. *Int. J. Climatol.* 26, 2243–2260. <https://doi.org/10.1002/joc.1364>

Above | Visualising the urban heat island (UHI) effect using a numerical weather prediction model and an urban canopy model. Image credit: Cooling Singapore; visualisation by CIVAL at Singapore-ETH Centre.

Above | Singapore and international urban climate experts at a Cooling Singapore workshop (image at the top; Photo credit: Cooling Singapore, Linda Meisen Photography) and the study's task force in discussion. Photo credit: Cooling Singapore, Singapore-ETH Centre.

### Measuring heat

To assess the UHI, the team uses a computer model that calculates the effect of urban morphology – including buildings and roads – upon air temperatures. The resulting map is validated against data collected from 14 weather stations operated by the Meteorological Service Singapore. The same model can be used to make a hypothetical map based on the assumption that Singapore is entirely covered by vegetation. The UHI is the difference in temperature between the 2 maps.

Assessing OTC has proved to be a bit trickier. To do this, the researchers choose a particular location where they monitor humidity, temperature and wind speed. They then ask passers-by a catalogue of questions related to their thermal comfort, including how hot or cold they feel, what activities they have been undertaking, and how long they have spent outdoors. The analysis of this data provided a better understanding of people's comfort levels under different microclimatic conditions in the city.

### Reducing heat

The team has produced a number of outputs based on the data collected. One of these was an energy flow diagram, known as a Sankey diagram, which maps the sources and losses of energy in Singapore. This has proved useful for understanding which sectors contribute most to the UHI. It has shown that, outside of industrial energy use, the largest users of energy are transportation and buildings, with much of the energy consumed in buildings going into air-conditioning.

The team also conducted simulation studies to show how new developments or particular weather conditions might affect the UHI. For example, an analysis of the impact of UHI during an inter-monsoon season in April 2016 revealed that UHI

effect can be as high as 5°C during the night. They are also studying how different interventions could affect meteorological conditions at the building and neighbourhood scale in Jurong Lake District, the Central Business District and a housing estate. Researchers are currently developing specific climate-responsive planning guidelines with quantitative and qualitative recommendations.

The published works that have been launched by Cooling Singapore are accessible to everyone from students to policymakers, and include a catalogue of mitigation strategies which outlines 86 measures to reduce UHI and improve OTC and a guide to 24 simulation tools to assess the impact of different strategies in reducing UHI and improving OTC.

All of these outputs have the ultimate goal of facilitating climate-informed urban planning, by helping urban designers and architects make more informed decisions. Already the team has examined a number of urban design scenarios based on local factors such as block size, block orientation, aspect ratio (which is the building's height in relation to the street's width), building height profile and urban typology or form. "For example, in an ongoing study with URA, we investigate how we can improve thermal comfort by stimulating wind flow, through means such as increasing the heights of shaded pathways," says Conrad.

The URA modeling project is just one of many collaborative projects undertaken by the team based on their findings. Cooling Singapore has also played a role in the Orchard Road Business Study which included an analysis of shaded pathways, carried out under the Future Cities Laboratory at the Singapore-ETH Centre in collaboration with public sector partners.



### Reaching out

Cooling Singapore has also undertaken 3 social campaigns to study the relationship between climate, urban space and people. "Our research wouldn't be complete if we aren't involving people in engagement studies, workshops and also surveys, in order to figure out how people feel about it and also about how open they are to certain mitigation measures," says Heiko.

More than 2,000 Singapore residents have participated in the social campaigns conducted in collaboration with the Singapore University of Technology and Design (SUTD) Lee Kuan Yew

Centre for Innovative Cities and non-profit design group Participate in Design, which included face-to-face surveys, online surveys and workshops. Through workshops with residents, the group discovered that residents prefer strategies such as green streetscapes and void decks over cool bus stops or the introduction of renewable energy.

"In ensuring the robustness of our research, we are going into breadth in addition to depth, in the sense that we reach out to government agencies and citizens, through surveys and workshops," says Heiko, who believes that the multidisciplinary feature of Cooling Singapore makes the study unique.

Above | On-site measurements and surveys by the Cooling Singapore team to study the relationship between climate, urban space and people. Photo credit: Cooling Singapore, Linda Meisen Photography.

**WHAT DO YOU PREFER?**

48 residents in Punggol ranked their preferences for strategies to improve outdoor thermal comfort during a workshop by the Cooling Singapore team.

1

**Green Streetscapes**

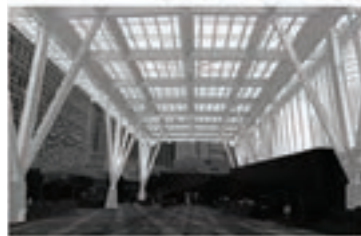
2

**Void Decks**

3

**Shaded Neighbourhoods**

4

**Shaded Plazas**

5

**Electric Vehicles**

6

**Green Façades**

7

**Renewable Energy**

8

**Cool Bus Stations**

As part of the project, a task force was created, which consisted of representatives from a range of government agencies such as the URA, Housing and Development Board, National Parks Board, Building and Construction Authority and the National Environment Agency and universities such as the SUTD and Nanyang Technological University.

“The Cooling Singapore project is different from a typical academic research project,” says Heiko. “The idea was to bring together all these different agency representatives who have expertise from their specific domains to keep us grounded in reality and provide important feedback for our studies.” In addition to establishing a two-way information loop, Heiko says that task force workshops have also facilitated inter-agency communication on the issues at hand.

**What can we do**

For people who want to help reduce UHI in their everyday lives, Heiko suggests setting their air-conditioning temperature at least 4°C higher. If everyone in Singapore were to do this, the combined effect would be notable. Businesses, in addition to raising the air-conditioning temperatures, can also consider painting their buildings in lighter colours to reflect more of the sun’s rays.

At the city level, electricity generation could move offshore, away from the city, or even better, renewable energy could be encouraged. The increase in mixed-use districts is a promising trend. When residential, commercial, and recreational activities are located in close proximity, the need to

commute to work is reduced. Access to goods and services and recreation is also more convenient, which could encourage walking and the use of public transport over the use of private vehicles.

**What’s next**

Cooling Singapore is currently preparing a follow-up project that will take the urban planning and climate design concepts and link them to Virtual Singapore, a NRF project to create a dynamic three-dimensional city model and collaborative data platform.

“We’re also looking at a second phase, which would attempt to address issues that we identified in the first phase,” says Heiko, “to address the gaps but also widen the scope, because although the team is already multidisciplinary, with additional economic expertise, we will be able to answer questions such as, ‘What is the economic impact if we were to increase the temperature by a certain degree?’”

“We also want to have an educational component through courses because we feel that there would be a lot to be gained if we can share our knowledge with policy makers and others who can make a difference,” he says.

“We hope that the work that we do here can be shared with others. Singapore can be developed as a role model in this area, whereby we could export concepts and ideas that we develop here to other cities,” he adds.

For more information about the study, go to [www.coolingsingapore.sg](http://www.coolingsingapore.sg).



# Design frontiers

They are driving new design frontiers in their fields. Recognised in the President's Design Award in 2018, 5 designers discuss challenges, renewal and how to stay relevant.

Writer Justin Zhuang



*Designer of the Year*  
**Angelene Chan**  
Chief Executive Officer  
DP Architects (DPA)

As the head of one of the world's largest firms, Angelene has been repositioning and cultivating a design culture within DPA to ready it for new challenges. In 1990, she joined the company's retail team in the Suntec City project and went on to work on various award-winning projects including Wisma Atria and Sunray Woodcraft Construction Headquarters.

## What are some challenges in running a mega architecture practice today?

The practice of architecture is significantly different from what it was 30 years ago. Negotiating the shifts in the building industry requires resolve and full buy-in if we want everyone to move forward in the same direction. For a large size firm, it can be a challenge to reach consensus swiftly. The larger the firm, the more factors there are to overcome to achieve consistency which is important to maintain a competitive edge.

## How is the traditional way of running the practice no longer relevant?

In the past, the architectural design takes precedence and the architect is the key decision maker. This is not always the case today with competitive real estate conditions, advancements in construction technologies and preferences for building models that focus on efficient execution, for example, design-and-build. Architects have to approach design as a part of an integrated service, even from the early stages.

The profession will also have to integrate technology in every aspect of the work process. We must also play multiple roles: going beyond the traditional scope of design and project management, and developing knowledge in related disciplines.

## How is DPA rejuvenating itself?

In the last couple of years, we have begun focusing on research as a key driver in architecture. Today, we have 10 typology research groups to investigate new trends, developments and technologies. Our explorations in the hospitality typology led to the development of an app that can generate hotel quantum with simple data entry on our mobile devices.

We have also started a Design Intelligence Unit to further integrate new technology into our work process. A few months ago, the unit and our specialist office, DP Sustainable Design, created NimbleSIM, an application that facilitates automatic model preparation. It is able to gather and process data from different software platforms. Through automatic simulation, it tests the sustainability performance of our designs and the results also contain multiple design options with a corresponding performance index. This equips our designers with the right analyses to make informed decisions quicker.

## Any advice for other architecture practices?

Constantly reinforcing the core corporate values or culture is critical to the success of any business. Our culture of collaboration, collective-over-individual, emphasis of being a big family is something that we hold dear. For a creative profession like architecture, the biggest asset of any practice is the people. It is important to develop, manage and retain talent by creating the right working environment that drives them to do their best.



Above | A selection of DP Architects' works: 1. The Dubai Mall. 2. Sunray Woodcraft Construction Headquarters. 3. Temasek Club. 4. Wisma Atria. 5. The Novotel Singapore and Mercure Singapore on Stevens. 6. Noon Square. Photo credits: Alvin Arre, Chopper Shoot Productions, DP Architects, James Poh, Marc Tey, Mori Hidetaka.

*Designer of the Year***Hans Tan**

Founder, Hans Tan Studio  
Assistant Professor,  
Division of Industrial  
Design, National  
University of Singapore

As a practitioner and an educator, Hans has consistently questioned the nature of design and the traditional assumptions of a designer. Challenging the notion that design is just about problem-solving, he has created an innovative body of work that puts Singapore in the centre.

**What are some challenges in design education today?**

One of the key dilemmas is deciding between a curriculum that leans towards developing specialists in a design domain or one that trains generalists who can successfully negotiate across different design disciplines. I believe that design education can no longer produce “industry-ready” graduates as many of their skill sets start getting obsolete as soon as they enter the workforce. Therefore, developing the mental and emotional aptitudes of a designer is as important, if not more so, than emphasising on the craft of design. Producing designers with creativity, empathy, resilience, adaptability and a growth mindset is key to future-proofing them.

**Why is the traditional mode of educating designers no longer relevant?**

The “master and apprentice” studio model of design education is perhaps outdated.

Although the authentic, problem-based learning of studio projects are still very beneficial to design education, the manner in which they are run – with students bringing in work weekly to consult with the studio master – does not offer the most enriching learning experience. The studio experience can benefit from a different typology of programming and complementary engagements with the use of digital technology and social media.

On the other hand, the advent of digital tools and an overall downsizing of workshop areas for design students has compromised learning through hands-on making and experimentation. The over-emphasis on the creative role of human-centred design, where good ideas stem from good user research, has also contributed to the decline of prototyping as an important design skill. This has led to an unbalanced preference for thinking with data instead of with one’s hands. Studies have shown that we solve both analytical and creative problems with an increased success when we use our hands to work out the solution, regardless of one’s cognitive abilities.

**How are you rethinking the education of a designer?**

The concept of “Thinking by Making” forms a big part of the design studios I lead. There is a big difference in superficially focussing on the hand-made – which detracts from my intentions – and making (with one’s hands) as a crucial mode of thinking for a designer. My design briefs compel students to build up their intuition of hands-on thinking by practising iterative making. They learn to “play around” and negate planning first. Conversely, if you plan something to make, you are certainly not “playing around”. Learning to play is such a contradiction. My 2 sons, aged 3 and 6, don’t have to be told how to play. They will do crazy things with whatever they set their hands on.

With the revamp of the Design Fundamentals studio for the Division’s first-year students, I am also leading a short, 6-week studio. “Fascinating Flour” gets students to arrive at a fascinating piece of cooked flour by intervening in the material (flour) and process (steaming). Having a penchant for cooking, I discovered that edible materials and culinary processes provide the best premise to learn hands-on experimentation.

**Your advice to design educators?**

I quote philosopher Martin Heidegger: “The hand’s essence can never be determined, or explained, by it being an organ which can grasp... Every motion of the hand in every one of its works carries itself through the element of thinking, every bearing of the hand bears itself in that element...”

*Design of the Year***László Herczeg & Lekshmy Parameswaran**

Directors, [fuelfor design and consulting](http://www.fuelfor.net)

([www.fuelfor.net](http://www.fuelfor.net)) and [The Care Lab](http://www.thecarelab.org)

([www.thecarelab.org](http://www.thecarelab.org)) for *Who Cares?*

*Transforming the Caregiving Experience in Singapore*

Through an ethnographic study of 10 caregivers in Singapore, and supported by insights from clients and stakeholders in the sector, fuelfor came up with a design strategy to systematically tackle the indifference that caregivers face in their everyday lives. It consists of 7 concepts which offer wide-ranging solutions that can transform the future of caregiving in Singapore.

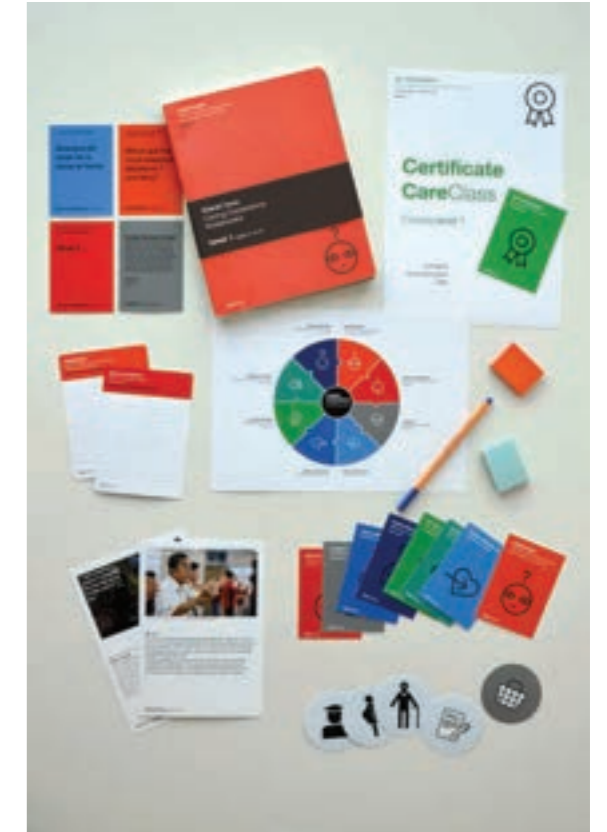
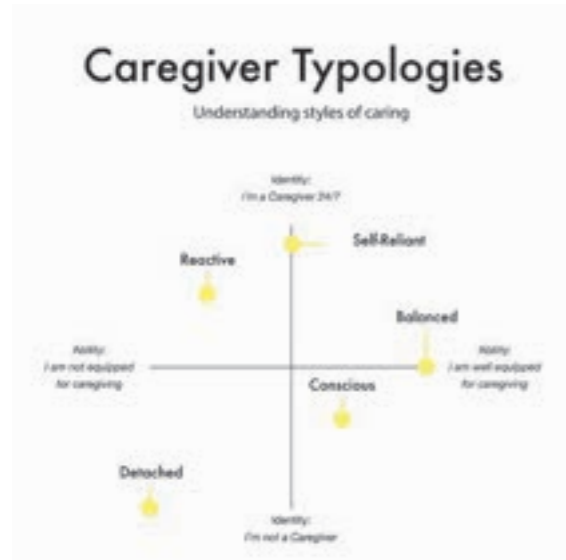


Photo credit: fuelfor

**What are some challenges in the social sector today?**

Our ongoing projects touch on various universal issues. One example is mental health, which has a stigma that makes it difficult for people to talk about as well as support patients and their families. Another topic is ageing, which we are helping to reframe as a positive life stage and an opportunity for growth rather than a much-feared period of decline. We are also exploring new models of day hospice care as well as end-of-life care settings and spaces and conversation tools.

Above | A selection of Hans' works: 1. *In Spotted Nyonya* (2011) 2. *Striped Ming* (2013), old vessels are given new life by removing existing layers. Photo credit: Hans Tan Studio



**How has the role of design in social care changed?**

Designers have not been as active in social care as compared to the healthcare sector where they feature prominently in medical technology product innovation, designing healthcare spaces and, more recently, improving processes and patient experiences. The healthcare industry is increasingly embracing design thinking as a human-centred approach to innovation and designers have more opportunities to generate new concepts to test and launch in the market. However, there are bigger questions that are fundamental to care that call for a new frame of thinking.

**How are you rejuvenating the role of design in the social sector?**

We are setting up The Care Lab to build on our work in the healthcare sector and look at the landscape of "care" as a whole. This helps us better identify and address the systemic issues that exist between institutions and sectors. Care is a topic that will shape new ways of living, learning, working, ageing and dying.

**What projects of yours exemplify this new way of thinking?**

Our latest projects are in some ways spin offs from Who Cares?. One project in Singapore is working with the non-profit organisation Equal Ark to provide equine-assisted therapy to persons with disabilities and their caregivers. We are also partnering with medical device players and public hospital partners in Spain and Portugal to design new products, services, programmes and platforms to support caregivers of people with chronic disease.



Photo credit: fuelfor



Fudao. Photo credit: Zhou Yue Dong

**Any advice for designers in the social sector?**

There is not enough of us here! Industries and governments are recognising the value that design can bring to business and innovation. Now, we need to demonstrate what design can do. It's important to consider the why as well as the what. This requires designers to have a more conscious and considered approach. We have to design more compassionate and sustainable societies, systems and solutions where people can play a role in shaping their world. Not every designer is ready for this, but more are daring to think more about their role beyond profit and towards social purposes. It is a great moment to be a designer :-)

*Design of the Year*

**Look Boon Gee**

Founder & Managing Director, LOOK Architects for China Fuzhou Jin Niu Shan Trans-Urban Connector (Fudao)

Once an obstacle in Fuzhou, the mountains of Jin Niu Shan have been transformed into a network of connections with a 19-km elevated walkway designed by LOOK Architects. Not only has this made it easier to get around, this piece of urban infrastructure coupled with 10 different entrances has brought its people closer to nature and revitalised the historic Chinese city.

**What are some challenges in urban infrastructure design today?**

One of the main challenges we face is in the contesting and conflicting land use. Often, urban centres experience escalating real estate cost as well as competing demand for spaces for different uses, including housing, transport and defence. These pressures on land use can diminish the quality of public spaces in cities. Most urban infrastructure projects such as bridges, crossings and transport nodes will encompass the creation of public amenities, including public spaces. Hence, urban infrastructure can be a catalyst for people-centric public spaces that can be further transformed through the application of thoughtful, good design.

**How is the traditional approach to urban infrastructure no longer relevant?**

Historically, architects and planners have seen their role as one of revitalising and rejuvenating certain parts of the city, for example in confronting urban decay in the inner city. This can be expanded in today's context to encompass the transformation of hostile, uninhabitable and unproductive urban environments into healthy, pleasant and environmentally-friendly spaces. We advocate for a more holistic view that takes into consideration environmental, climatic and qualitative experiences of living in the city.



Fudao. Photo credit: Zhou Yue Dong

### How are you rethinking urban infrastructure design?

Urban infrastructure projects are typically engineering oriented and highly functional. What we did was to bring a humanistic touch and an imaginative approach to this domain. We see the role of urban infrastructure as having a social significance that extends beyond just aesthetics. This is something we tried to achieve in the Fuzhou Jin Niu Shan Trans-Urban Connector (Fudao). The project has attracted many visitors from the surrounding region and has become a destination. The project has been recognised by the P\*DA, the Chicago Athenaeum International Award and the Design for Asia Grand Award, who have all highlighted the social and sustainable dimensions of the project as key to its success.

### What new projects of yours exemplify this?

We have been invited to design other innovative pedestrian connectivity systems within highly eco-sensitive spaces like Jiuzhaigou and complex urban centres like Xiamen where we continue to explore designs that are aesthetically pleasing, functional and also responsive to the local culture. Like Fudao, such systems play an important role in providing a pedestrian friendly route for urban dwellers. They make areas accessible via a network of pathways and help to stitch up certain important nodes making the city more vibrant and dynamic.

### Any advice for designers of urban infrastructure?

To be sensitive to different cultures and places and to deploy both innovative design and appropriate technologies. To be a good learner as our built environment demands more than just good architecture alone but also a greater understanding of in-between spaces and a more sensitive approach to the relationship between greenery and built spaces.

### ABOUT THE PRESIDENT'S DESIGN AWARD (P\*DA)

It is Singapore's highest honour for designers and designs across all disciplines. It recognises the achievements of an extraordinary group of people making a difference to the lives of Singaporeans and the global community through excellent design. It is presented in two categories – Designer of the Year and Design of the Year and is jointly administered by the DesignSingapore Council and URA. Check out the P\*DA roving exhibitions at Changi Airport Terminal 3 (until 1 Mar) and library@orchard (until 29 Mar). For more information about P\*DA, go to [www.designsingapore.org/pda](http://www.designsingapore.org/pda)

Other President's Design Award winners in 2018 – Design of the Year

#### Mediacorp Campus

Fumihiko Maki  
Principal, Maki & Associates  
in collaboration with DP Architects

#### Oasia Hotel Downtown

Wong Mun Summ  
Founding Director, WOHA Architects

#### The Tembusu

Khoo Peng Beng  
Director, ARC Studio Architecture + Urbanism Pte Ltd

#### Changi Airport Terminal 4

Yam Kum Weng  
Executive Vice President, Airport Development & Advisor, Air Hub Development, Changi Airport Group

#### The Future of Us Pavilion

Prof. Thomas Schroepfer  
Professor & Director, Advanced Architecture Laboratory, Singapore University of Technology and Design

#### The Warehouse Hotel

Chris Lee  
Creative Director and Founder, Asylum Creative

#### weatherHyde

Prasoon Kumar  
Co-founder & CEO, billionBricks



## New travels and old biscuits

Humble and understated, yet alive with memories and stories – we explore how The Great Madras and Khong Guan Building have been beautifully restored, inspiring us to remember the past and embrace the new.

Writer **Serene Tng** | Photographer **Chee Boon Pin**

### The great escape

Located in the bustling Little India Historic District is a little haven in The Great Madras, a boutique hotel. The Art Deco building was originally built as Singapore Improvement Trust (SIT) flats in the 1940s and became a no-frills budget hotel, before being lovingly restored by FARM into a 35-room hostel and hotel.

Richly embellished with geometric shapes and colourful patterns, the hotel is both welcoming with its open concept lobby and intriguing with its many wonderful nooks and corners. Entering the hotel feels like a great escape into another world, into the past and into our own imagination. Peter Sim from FARM Architects lets us into the hotel and shares the inspiration and efforts behind the restoration.



This project illustrates how a budget hotel, housed in a pre-war apartment building, has been cleverly revamped...to relive the charms of travel reminiscent of the 1930s Art Deco age. Good effort was made to reinstate the original layout of the building, which has naturally ventilated and well-lit linear corridors, in keeping with the spirit of the shophouse typology.

#### AHA Jury Citation

#### Design

The brief given to us was to create a different kind of hotel, one that is easily accessible and affordable for different types of guests, and yet have a good design. We were inspired by the building itself and the lively energy in Little India. We were also inspired by the Art Deco building and introduced elements of the style throughout. It was also about creating spaces where stories can be told and moments can be experienced through the various spaces and corners.

#### Lobby

The lobby space is one of the key highlights of the building. We wanted to create an open and tropical living room space that has no doors to encourage a seamless flow between the hotel and the street. In a way, it becomes a new focal point for people to gather and contribute to the buzz in the neighbourhood.

#### Details

From creating quirky neon signs to producing a custom made wallpaper that captures Singapore's history and down to choosing the type of clock and books on display, every small detail plays a part in the experience. Washing machines were deliberately located in the lobby to encourage interaction between guests while doing their laundry.

#### Party-wall, staircases

We turned some of the original architectural features of the building into new opportunities, such as creating a distinctive circular opening in the party-wall between the new pool and sun-deck and using the spiral staircases as a spatial and visual link between floors.

#### Lessons

When restoring a historic building, you always have to be ready for surprises and be amenable and flexible to make changes along the way. We also want to make it a point to draw inspiration from our local architecture and design to allow people to discover the past and yet be able to experience new elements.



#### SHAIK ON THE GREAT MADRAS

Shaik Mohamed, director of Mini Environment Service Group, which owns The Great Madras tells us more about the hotel.

#### Why develop such a boutique hotel?

*We wanted to create a space which would allow people from all walks of life to experience a stay at The Great Madras. We didn't want to price ourselves as an exclusive getaway but an inclusive getaway. By doing so, we will encourage more people to walk through our doors, and people create vibrancy.*

#### What do you love most about The Great Madras?

*As a person who likes openness and natural light, The Great Madras has plenty of that in its own unique way. The best place for me within the hotel would be the communal lobby. Given the openness, it has the ability to invite anyone to explore.*

#### How are people experiencing the space?

*If a guest who has experienced a stay and has ventured beyond the hotel to the surrounding area, a guest would have had a complete experience of the area, that's what's important. There are others who look at the space and design, and it reminds them about Singapore's yesteryears and there is a nostalgic charm to it.*

Above and right | Explore The Great Madras with its open lobby space, distinctive opening at the pool and spiral staircases in the backdrop.

### Old biscuits

On another side of town lies another kind of neighbourhood landmark in the MacPherson-Tai Seng area. Those familiar with the neighbourhood remember walking past the Khong Guan Building or stopping to buy biscuits. It stood out for its distinctive edge at the junction of 2 roads – MacTaggart and Burn. In its heyday, the three-storey building was the tallest in the area. Constructed in 1952 and given conservation status in 2005, the building was owned by biscuit kings Chew Choo Han and Chew Choo Keng, co-founders of home-grown biscuit company Khong Guan. Taking nearly 2 years to complete the restoration works, Ar. Adrian Lai, director, META Architecture, feels that the restoration is important in providing a legacy for the Chew family and in celebrating an iconic local brand. We take a stroll around the building with Adrian.

### The star

This star is very special as it took some detective work to find out if its distinctive three-dimensional relief was part of the original building and once we established that, we restored it to its earlier form. The Khong Guan founders wanted a star on the building as a symbol of the Singapore spirit.

### Old and new

We were very careful to ensure that the new extension to the building did not overwhelm the old one nor mimic it but rather, drew inspiration from its scale and form. As part of the design, we created stacks of building blocks that aligned to the 2 roads where the building is located along. This re-emphasises its position as a major landmark and provides a sense of continuity between the old and new.

### Air wells and staircases

We created air wells and a staircase between the third and fourth storeys to connect the old building and new extension, creatively a sensitive co-existence between the old and new. The decision to have the headquarters office occupy the top storey within the conserved building which is then linked via an internal staircase to the fourth storey of the new extension, has meaningfully connected the past to the future.



### Old gate

This old gate used to be located on the third floor where the living quarters were for the Chew family who stopped living there since 1970. During the restoration works, the gate was discovered. It was brought down and retained, contributing to the charm of the building.

### Legacy

While the building may look humble and understated, such post-war building is equally as important as other historical buildings in being an integral part of our heritage. It is a way to remember our past, the origins of our local brands and serves as a form of a time capsule. I am inspired by the owners who were unfazed by challenges during the restoration process as they were focused on ensuring that the building was well designed, occupied meaningfully and one that continues to engage with the neighbourhood.



The efforts taken to marry the rich history of the company with the physical restoration adaptive reuse has given a new dimension to this industrial heritage building.

### AHA Jury Citation

### LONGTIME STAFF CHEW BAN CHYE ON KHONG GUAN

#### Tell us about your work at Khong Guan.

*I joined Khong Guan Flour Milling Limited at Tanjong Rhu Road in 1964 as a machine attendant. In 1992, Khong Guan Flour Milling moved into 2 Mactaggart Road, now the Khong Guan Building. Thereafter, my job involved logistics and sales, till now.*

#### What are your memories of the building?

*The 3 metal gates at the ground floor. The sharpest corner of the building was once a retail shop for biscuits. And the smaller door facing Mactaggart Road was the former staircase to the main building.*

#### How do you feel about the building being a part of our heritage?

*I feel very proud of it. When I meet someone who knows me, they would approach me smiling and say, "Uncle, the building is very nice!" I would say, "Yeah, it's nice. The interior is even nicer."*

### About AHA

*The annual URA Architectural Heritage Awards (AHA) scheme aims to recognise owners, professionals and contractors who have gone beyond the basic requirements to lovingly restore gazetted national monuments and conserved buildings to their former glory for today's use.*

*The 2018 Award winners are: Jurong Town Hall (Award for Restoration), The Great Madras (Award for Restoration), Khong Guan Building (Award for Restoration and Innovation), Kwek Hong Png Wing and Riverfront Wing at the Asian Civilisations Museum (Award for New Design in Heritage Contexts) and 29, 31, 33 Mount Sophia in Sophia Hills Development – former Trinity Theological College Chapel, former Nan Hwa Girls' High School, and Olson Building of former Methodist Girls' School (Special Mention).*

Above | The Khong Guan Building continues to be a landmark in the neighbourhood. The original side gate of the building is retained including an old gate brought down from the third storey (image above left). Adrian Lai is standing at the familiar entrance to the building with the distinctive red star.

# An expression of life

URA's new book celebrates the revolution and innovation in Singapore's contemporary architecture in the last 15 years.

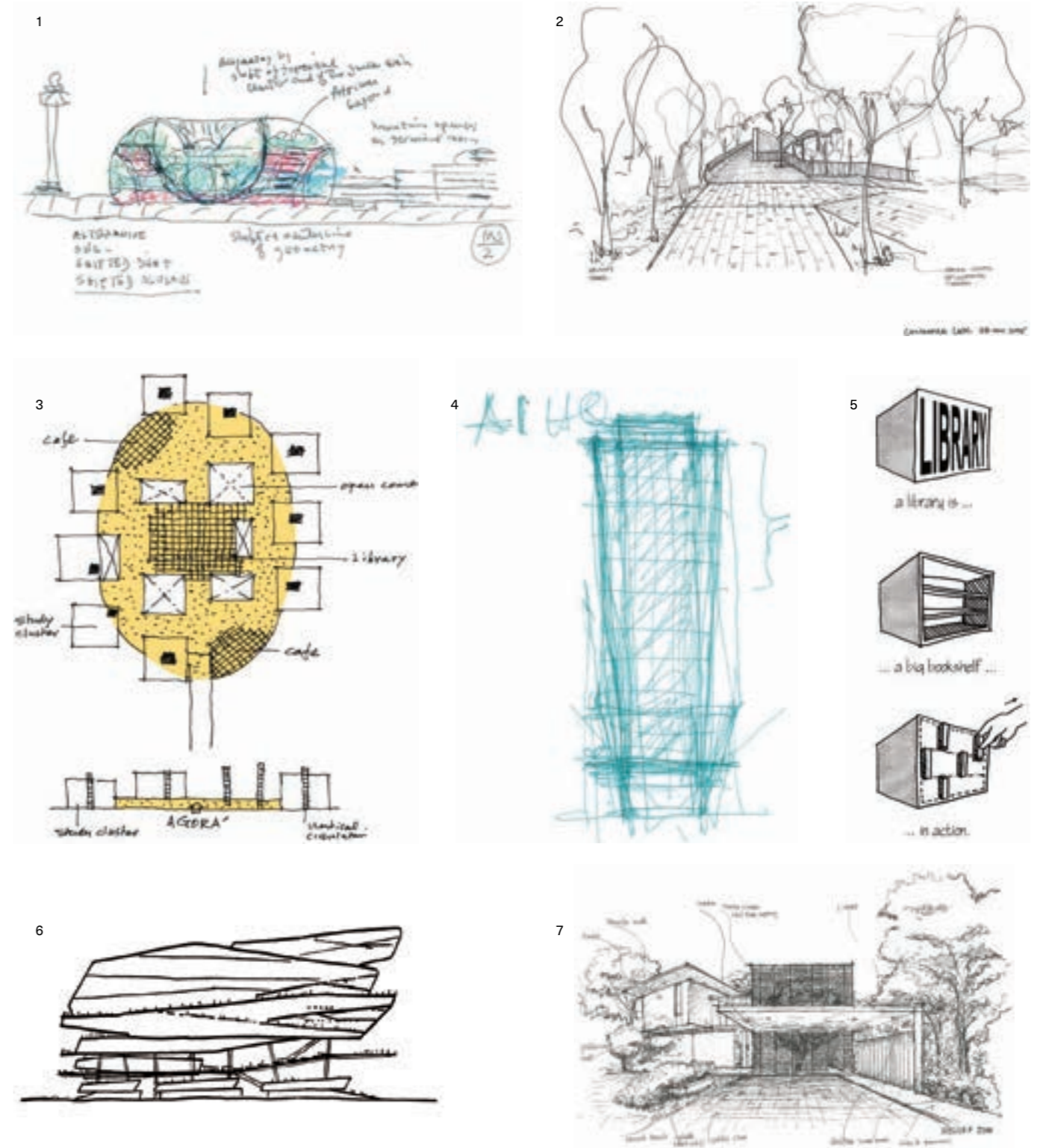
"Architecture is an expression of life in a place," says Erwin Vijay, head of the architecture and sustainable design pillar, SUTD (Singapore University of Technology and Design) and author of URA's new book, *Contemporaneous Architecture*. He sees it as response to an innate human desire for nature: high-rise, high-density and greenery as avenues for finding answers to urban challenges that architects face.

The new book to be published by March 2019 celebrates the revolution and innovation in architecture and what is contemporary and unique to the Singapore landscape and identity. In the book, professor and architect Li Xiaodong notes that the rapid urbanisation in the last years of the 20th century has provided new conditions for the second generation to come up with new visions and a unique urban tropical lifestyle that gives new meaning to everyday experience. He adds: "Singaporean architects have produced

a remarkable portfolio of innovative designs, pioneering what might be termed tropical urbanism approach to modern architecture in the context of monsoon Asia...ideas manifested in the new wave of practices are much more comprehensive in response to local social, operational, climatic as well as urban conditions and they have added new values of thought and enriched the vitamin pool of contemporary architectural language."

We present sketches that capture the early ideas of some iconic architectural works from the book that have shaped and defined Singapore's landscape.

*Contemporaneous Architecture in Singapore presents 70 architectural projects in the last 15 years, celebrating innovations, breakthroughs and distinctive designs unique to Singapore. To pre-order the book and for enquiries, write to [aude@ura.gov.sg](mailto:aude@ura.gov.sg)*



Above | Sketches of some of the architectural works featured in the new book, *Contemporaneous Architecture*: 1. Jewel Changi Airport, Moshe Safdie. 2. Henderson Waves, RSP Architects, Engineers & Planners. 3. Republic Polytechnic, DP Architects and Maki and Associates. 4. Tokio Marine Centre, CSYA. 5. Bishan Library, LOOK Architects. 6. Star Vista, Andrew Bromberg of AEDAS. 7. House 24, Park + Associates.

# At a glance

We check out the latest events and happenings shaping the landscapes and neighbourhoods around us.

## Sino-Singapore Tianjin Eco-City turns 10

The Tianjin Eco-city celebrated its 10th year anniversary in 2018. One of the three bilateral projects (the other two are Suzhou Industrial Park and the Chongqing Connectivity Initiative) between the governments of Singapore and China, the former 30 sq km wasteland has become a green and vibrant township. It is located in the Tianjin Binhai New Area, one of the fastest growing regions in China. Holistic master planning was applied in charting the development of the city, with experts from both countries sharing experiences and knowledge in areas such as urban planning, environmental protection, resource conservation and sustainable development.

It is the first eco-city in the world that uses a comprehensive set of 26 major performance indicators to guide its planning efforts. Singapore's experience was also adapted to meet local needs. For example, the concept of the community club with convenient services and facilities and the idea of park connectors linking green spaces and neighbourhoods were implemented in the Eco-city.

So far, an 8 sq km start up area has been completed and the next focus will be to develop its Central District. In envisioning its future, Lawrence Wong, Minister for National Development who was at the Eco-city to celebrate its 10-year mark shared: "...In order to continue as a front runner in eco-city development, it has to constantly innovate to succeed. The KPIs (key performance indicators) have set for us high standards – many of which we will need to think of innovative ways to achieve. To execute our strategies, the 2 governments and various stakeholders must work together, and promote research and innovation in the Eco-city." Singapore and China also signed a memorandum of understanding in September 2018 to promote the replication of the Eco-city's development experience in future regions.

**More info** [www.tianjinecocity.gov.sg](http://www.tianjinecocity.gov.sg)



Above | Tianjin Eco-city from the Rainbow Bridge in 2008 before construction work began (image at the top) and the city in 2016. Photo credit: Sino-Singapore Tianjin Eco-City Administrative Committee.



## Visit art exhibition, "Locality. Memory. Reconstruction"

Explore 50 artworks that uncover hidden and unique perspectives of Singapore that contribute to a sense of home and belonging. The artworks are a collaboration between "BE", a group of 7 passionate women spreading the love of making art, those who have special needs and students from the NorthLight School Art Club. The works are a way to express one's identity and local lifestyle through a series of mixed media painting, collage and sewing pieces.

**When** 12 November 2018 – 1 February 2019  
**Where** City Canvas at the Singapore City Gallery, third floor

## Watch out for a new AUDE exhibition space

# AUDE SPACE

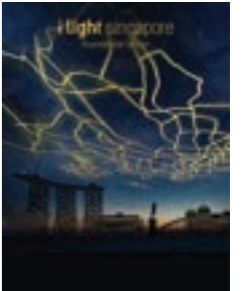
The new exhibition space within The URA Centre will feature new ideas and projects on architecture and the built environment to encourage greater appreciation for architectural excellence and to inspire further dialogue on good designs and urban solutions. The space is part of the architecture and urban design excellence (AUDE) programme to foster a stronger design conscious community. Architectural and design practices, especially the small, medium and emerging firms can also use this space to showcase their projects and portfolios.

**When** From March 2019  
**Where** The URA Centre ground floor  
**Enquiries** Write to [aude@ura.gov.sg](mailto:aude@ura.gov.sg)

## Be part of i Light Singapore – Bicentennial Edition

The popular i Light Marina Bay is back with a special i Light Singapore – Bicentennial Edition that reflects on Singapore's history and connection to the world in the last 700 years as it kick-starts the Singapore Bicentennial commemoration. A key highlight is a specially designed installation, "City Gazing Singapore", that will resemble the map of Singapore. Singaporean industrial designer Yun who enthralled visitors with her installation, "Moonflower" in 2017 is back with "The Rainbow Connection", featuring solar light modules in upcycled PET containers suspended in the air. The festival will also be extended beyond Marina Bay to the Civic District, Singapore River and Raffles Terrace at Fort Canning Park.

**When** 28 January to 24 February 2019  
**More info** [www.ilightsingapore.sg](http://www.ilightsingapore.sg)



## Look out for new public benches

A new generation of uniquely designed benches made using the old timber seating planks from the former National Stadium will soon be unveiled. The old planks were previously used to create more than 90 benches located in 23 public spaces across Singapore through the 'bench' and 'Pick a bench, Pick a place' initiatives. Check out the winning designs of the 'Re:Bench' competition that will be installed at Marina Bay, Singapore City Gallery and Singapore Sports Hub. You can also adopt a bench for the benefit of charities under Community Chest.

**When** From March 2019  
**Enquiries** Write to [aude@ura.gov.sg](mailto:aude@ura.gov.sg)







This red star is a distinctive part of the Khong Guan Building, a conserved neighbourhood landmark that has been beautifully restored. It was awarded the Architectural Heritage Award in 2018. More on page 39.