

CITIES ROUNDTABLE 2015



Linking Research to Practice

Organized by:

CENTRE for
LiveableCities
SINGAPORE

Hosted by:





**Khoo Teng Chye,
Executive Director, CLC**

Image credit: Centre for Liveable Cities

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What are the government agencies here for? They are here because they are looking at some of the **most difficult urban challenges that land-scarce Singapore is facing**. This year, Singapore celebrates 50 years of what we have achieved — in spite of grave challenges — in areas including urban planning and development. **But the next 50 years is going to be an even bigger challenge**. It goes beyond population growth. How do you make sure the city is **liveable, green, clean, blue** and so on? Those are the challenges that we face. Government agencies are hoping that they can tap into the ideas and work of research institutions to tackle some of these big challenges.

”

**Khoo Teng Chye,
Executive Director of the Centre for Liveable Cities**

“

We should **extend this collaboration as much as we can**, and if there are projects we can work together on, we should. From what we hear today, perhaps next year, we could plan to bring in more policymakers. They ought to listen to what we're saying about regulations and governance. We have to bring in businesses. Some of the businesses may respond to the ideas and participate in refining them. We could think about including students from different universities. They can present their urban solutions, and be included in the **conversation about cities**. Finally, we could bring in some of the political decision makers, and have a session that focuses on governance. This is because **governance of a city is really important**.

”

**Professor Chan Heng Chee,
Chairman of the Lee Kuan Yew Centre for Innovative Cities**

**Professor Chan Heng Chee,
Chairman, LKYCIC**



Image credit: Centre for Liveable Cities

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ABOUT THE CITIES ROUNDTABLE



Image credit: Centre for Liveable Cities



Image credit: Centre for Liveable Cities

The fourth edition of the Cities Roundtable was co-hosted by the Centre for Liveable Cities (CLC) and the Lee Kuan Yew Centre for Innovative Cities (LKYCIC). It was held on 9 November 2015 at the Singapore University of Technology and Design (SUTD). A total of 22 Singapore Public Service agencies and 23 research institutions participated in the event.

CLC convenes the Roundtable annually to bring researchers and policymakers together to share their thoughts and research findings on urban challenges and solutions. Through the Roundtable, we hope to catalyse collaborations between government agencies addressing difficult urban challenges, and Singapore-based research institutions developing appropriate solutions. By doing so, we hope to promote an integrated and multi-disciplinary approach to tackling Singapore's urban challenges.

This year's Roundtable focused on three key research areas:

Informed Mobility – how big data and stakeholder participation are changing urban transport and design;

Building with Nature – how natural processes can be incorporated in urban planning and development;

Future Urban Living – what kinds of future urban spaces can enhance liveability in Singapore

This year's Roundtable concluded with a segment titled "Possible Collaborations and Synergies", where the co-hosts shared their respective research workplans, with an invitation to collaborate to design creative and practical urban solutions for Singapore.

In the next few pages, we report their respective invitations to collaborate as well as the five key perspectives that emerged from the Roundtable:

- Enable Disruptive Innovations,
- Understand the Community,
- Mainstream Nature,
- Collaborate Upstream,
- Innovate Across to Achieve Multiple Goals.

PART I: PERSPECTIVES

William Henry Clune
Assistant Director, Sustainable
Earth Office



Image credit: Centre for Liveable Cities

“It's hard for governance to keep up with technology and innovation.... Maybe it does seem risky from the perspective of governance to be flexible, but that is the thing to build into the system.”

William Henry Clune
Assistant Director, Sustainable Earth Office
(Nanyang Technological University)

1 | ENABLE DISRUPTIVE INNOVATIONS

Technological innovations have transformed the way we move in cities. Taxi booking mobile apps, such as Uber and Lyft, are disrupting the business models of well-established taxi companies. There is a growing perception that these young, tech-driven businesses are providing higher quality and more affordable services than the incumbents. Nevertheless, some think that these new businesses are no more than unlicensed transport providers, circumventing regulations that exist to protect consumers.

One key challenge for many societies is that technological innovation in the transport industry has raced ahead of governance. Companies such as Uber and Lyft are establishing footholds in transport services markets and in consumers' hearts, before city governments can decide whether and how to accommodate these new businesses.

A. Accommodate

The Roundtable's participants generally agreed that the Singapore government should enable such businesses to flourish. Where regulations were concerned, a light touch is preferred. Professor Chan Heng Chee cautioned against over-regulating. She expressed that it would be more difficult to dismantle harmful regulations than to implement sensible ones in future to respond to new challenges.

B. Optimise

Where infrastructure was concerned, Dr Lynette Cheah, Assistant Professor at the LKYCIC, shared that governments did not have to make large investments to accommodate these tech-driven businesses because these businesses tend to focus more on how to extract value from existing infrastructure and transport assets, rather than how to build and own more.

C. Share

Ride-sharing is a promising way to make more efficient use of vehicles and road. Professor Lim Ee-Peng and Associate Professor Zheng Baihua at the Living Analytics Research Centre (LARC) at the Singapore Management University (SMU) found that ride-sharing could improve the success rate of booking a taxi during the morning peak period. With the right pricing mechanism, taxi drivers can earn more when they pick up two or more passengers with journeys that overlap. Passengers can also benefit from lower fares, and more reliable taxi services. At the city level, ride-sharing makes more efficient use of scarce road space, and reduces pollution.

Ride-Sharing to Improve Taxi Performance

There are about 28,000 taxis in Singapore. Yet, the perception is that they tend to be unavailable and insufficient during peak hours and rainy days.

Professor Lim Ee-Peng and Associate Professor Zheng Baihua tried to quantify this problem. By using the taxi booking data of a local taxi company collected over a 21-day period, they found that only 30 to 40% of taxi bookings made during the morning peak hour periods were fulfilled.

They then devised a model under which passengers and taxi drivers would be able to share rides, and found that doing so could increase the success rates of taxi bookings.

Their ride-sharing model hinged on three key assumptions. First, passengers will share taxis if they get to enjoy fare savings. Second, taxi drivers will pick up several passengers with overlapping journeys if the drivers can earn a higher fare. Third, there is a mechanism – perhaps a mobile phone app – that matches willing taxi drivers to willing passengers.

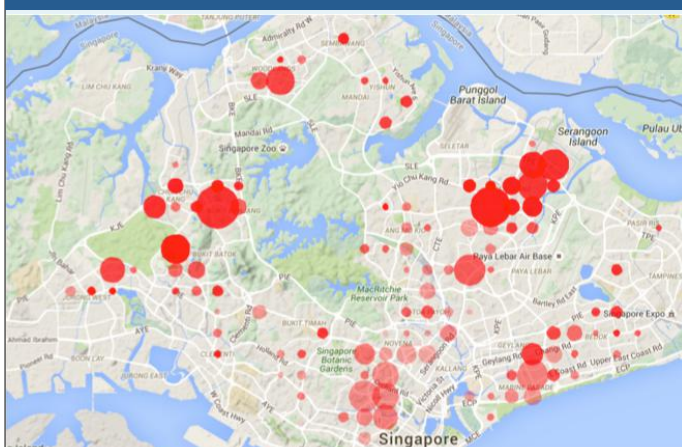
The researchers found that about 78% of taxi bookings made on a single work day could be shared if:

Passengers could expect 20% savings; and
Taxi drivers could expect 10% more revenue than the highest possible fare than they could have earned if picking up passengers individually.

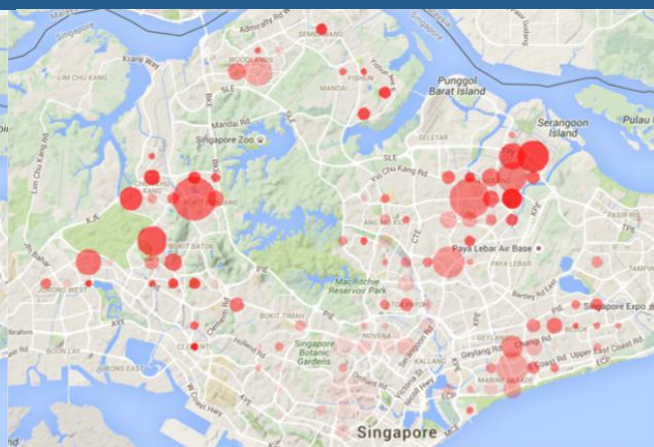
Ride-sharing could also improve the success rates of taxi bookings. If there were 500 taxis on the streets, distributed according to the taxi booking data, success rates could improve by 20 to 30%.

Their research was supported by the Singapore National Research Foundation's International Research Centre @ Singapore Funding Initiative, which is administered by the Interactive Digital Media Programme Office at the Media Development Authority.

Taxi booking data without employing ride-share



Taxi booking data employing ride-share



The size of the circle corresponds to the booking volume, and the colour intensity corresponds to the probability of booking failures.

Image Credit: Living Analytics Research Centre, Singapore Management University



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*We really have to do a better job in **sensing people's needs**... this will require us to be able to gain access to more data about our cities and our people moving in the cities.*

”

**Professor Lim Ee Peng
Director, Living Analytics Research Centre
Singapore Management University**

2 | UNDERSTANDING THE COMMUNITY

Researchers and policymakers have devised a myriad of methods to understand their communities.

Traditional data processing

The traditional method, where researchers collect and analyse data, continues to be important. The Centre for Urban Greenery and Ecology (CUGE) adopted this approach to investigate whether parks were improving quality of life of their users.

The project, led by Research Fellow Dr Christine Vogt and Cybil Kho, observed 3,989 groups of park users and collected 1,089 surveys to find out what people did at parks and why they were visiting them. Three parks were selected for this project: Punggol Waterway Park, Bishan-Ang Mo Kio Park and Bedok Reservoir Park.

CUGE's researchers found that people went to these parks mainly to exercise. They were drawn to the parks because of their greenery, tranquillity, and proximity to home. These findings validated policymakers' belief that public parks provided social and health benefits to Singaporeans.

Big data

Today, big data is a much-discussed method for understanding communities. Its appeal lies in its use of data mountains that most governments already collect, but seldom use. Data scientists have repeatedly demonstrated that these idle data can be harnessed to help in policymaking. One example is the investigation about "bus bunching" conducted by Pieter Fourie, Dr Alexander Erath, Ordonez Medina Sergio Arturo, Artem Chakirov, and Professor Kay Axhuasen from the Future Cities Laboratory (FCL). Bus bunching happens when two or more buses serving the same route arrive at a bus stop at the same time. It frustrates commuters and reduces the reliability of bus services.

Using existing EZ-link data, which records most passenger trips made on buses and trains, the researchers investigated ways to reduce bus bunching. They found that splitting long bus routes into two parts could improve on time bus arrivals by about 35 per cent, as each bus would then need to make fewer stops and is in turn exposed to fewer potential delays. Big data analysis also enabled the researchers to make nuanced predictions about commuter behaviour. For example, researchers could predict how travel times and the number of transfers would change as a result of the splitting of routes. They could also predict the impact on other public transport services as passengers switched to the more reliable bus service or away from it.

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Listening

All this is not to say that quantitative data is the only way to understand the community. Such data could be of poor quality, be misanalysed, confidential, or fail to capture important factors such as human sentiments. Therefore, listening to people remains an important tool for city researchers. This is, in fact, one of the research methods that Dr Lynette Cheah is using for her forward-looking research regarding passenger and freight transport in Singapore.

Dr. Cheah's study is one of seven projects under LKYCIC's Future of Cities programme. These projects examine the challenges that Singapore is likely to face in the next 25 years in diverse areas including transport, economy, and urban typologies.

Dr Cheah's project on future transport seeks to answer questions such as what future mobility would be like in the city, and which technologies would make the travel experience safer, easier, more cost-effective, inclusive and pleasant. To gather data points, Dr Cheah's team is interviewing a range of stakeholders including transport operators, start-ups, technology companies, and industry consortiums. Through these interviews, they have uncovered 21 forces that are likely to affect mobility in Singapore, including demographic change and urban form.

Dr Lynette Cheah emphasises the need to listen to key stakeholders in planning for the future of transport

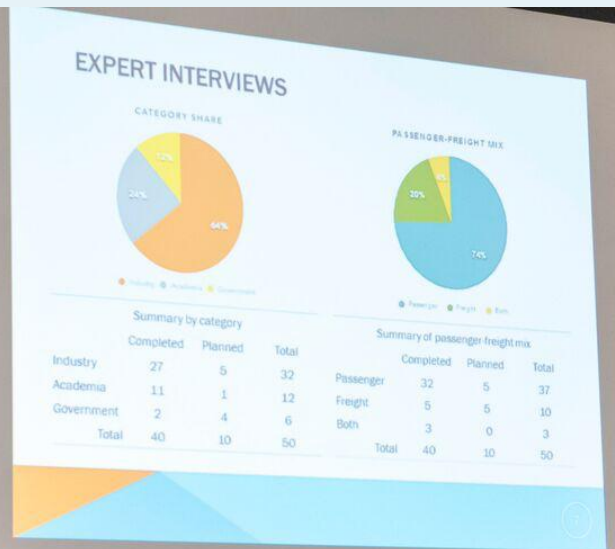



Image credit: Centre for Liveable Cities

A photograph of Dr. Tan Puay Yok, an Associate Professor at NUS, speaking at a podium. He is wearing a blue and white checkered shirt. The podium has a microphone and a silver cylindrical object. The background is a plain wall.

Dr Tan Puay Yok
Associate Professor, NUS

Image credit: Centre for Liveable Cities

“ If you want to understand trade-off, then the first step is to identify the values that (green spaces are) providing. Quantify if possible, or at the very least, describe it. So that we know what we are giving up in return for what we are going to get. ”

Dr. Tan Puay Yok
Associate Professor
School of Design and Environment
(National University of Singapore)

3 | MAINSTREAM NATURE

Traditionally, urban development involved building *against* nature. For example, in low-lying coastal areas, governments invested in building hard infrastructure such as dykes, dams, levees, and sea gates to function as bulwarks against nature.

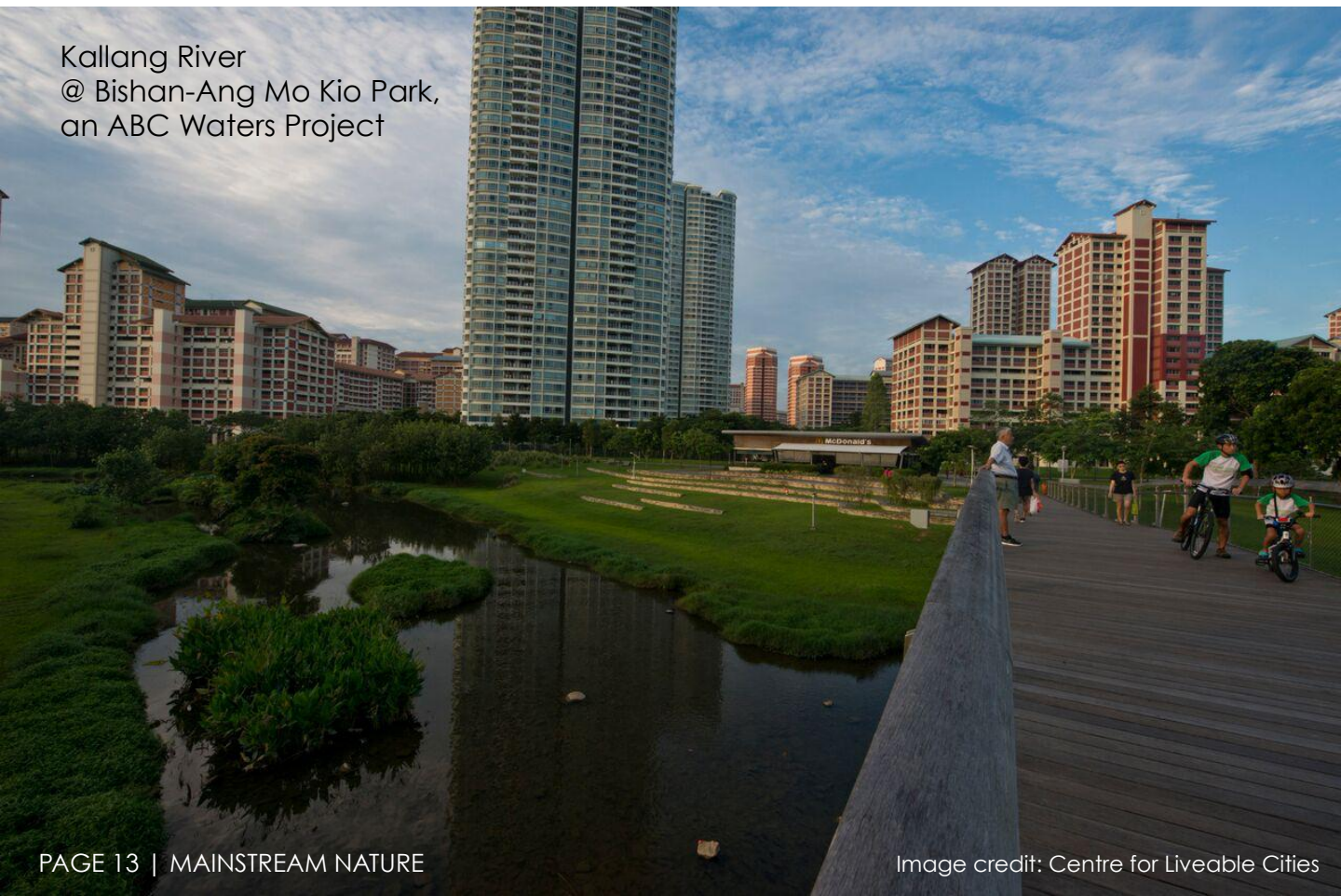
In recent years, policy conversations have shifted as a result of population and resource pressures, as well as climate change. Instead of building against nature, cities (especially Dutch ones) are building with nature. These cities are realising that building more hard infrastructure against nature might not protect them from the effects of climate change. In addition, doing so could further harm their ecologies. They are therefore turning to softer, multifunctional solutions such as designing

public squares and garages that can also function as catch basins for rain and floodwater, and constructing reservoirs that expand recreational opportunities while also serving as water catchments.

A. Benefits

According to Helena Hulsman, researcher at the National University of Singapore (NUS)-Deltares Alliance, building with nature solutions are improving flood safety, environmental quality, bio-diversity, water quality and liveability. This has also been Singapore's experience with the Active, Beautiful and Clean Waters (ABC Waters) programme, which transforms utilitarian drains and canals into beautiful waterways. These waterways are, in turn, integrated with the surrounding greenery and environment.

Kallang River
@ Bishan-Ang Mo Kio Park,
an ABC Waters Project



B. Upstream Planning

In spite of the benefits, building with nature projects in Singapore still tend to be ad-hoc, as its principles have yet to be mainstreamed in urban planning processes. Khoo Teng Chye, Executive Director at CLC, said that Singapore should mainstream these principles, especially in the area of water management. "It's more than just beautifying a canal," he said referring to the ABC Waters Programme. "Doing something like the Punggol Waterway, for example, requires upstream planning." Punggol Waterway is an example of an ABC Waters project. It was originally conceived as a pipe connecting the Punggol and Serangoon reservoirs but was later transformed into a waterway, thanks to the vision of the then Minister of National Development, Mah Bow Tan.

C. Maximise Value

Associate Professor Tan Puay Yok at the NUS School of Design and Environment cautioned that in land scarce Singapore, it might not be feasible to increase green cover indefinitely. Instead, building with nature—in Singapore's context—should focus on maximising the value that we derive from nature, and not on the quantum. Like Hulsman and Khoo, he too emphasised that green spaces had to be multi-functional, and integrated with water and buildings. He added that policymakers should focus on involving more stakeholders in deciding the trade offs between greening and other land uses. Policymakers can also improve access to nature for all socio-economic groups.



Punggol Waterway

Building with Nature in Rotterdam

When it comes to building the city with nature, Dutch examples are usually cited.

The City of Rotterdam, in particular, is no stranger to this approach. Sitting below sea level, the city is prone to flooding and unpredictable rainfalls. Traditionally, the city managed these water threats by building hard infrastructure along its coasts and waterways. These include sluices, dikes and pumps powered by windmills. But these hard barriers damage existing natural ecosystems. In addition, there is a limit to how high the dikes can be built to protect the city from water.

So even as flood risks increase due to climate change, the Dutch are adopting a new strategy. Rather than fighting with water, they are contriving to live with it. The Dutch have implemented several living-with-water solutions by integrating the know how of various disciplines including engineering, ecology, architecture and social sciences. These solutions tend to be multifunctional. For example, floating homes and reservoirs not only expand recreational opportunities, but also accommodate rises in water levels. More broadly, multifunctional solutions enable cities to transform what was once an existential threat into an opportunity to build a more sustainable environment that supports a high quality of life.

The Maeslantkering, the sea gate in Rotterdam



Image credit: bertknot, <http://bit.ly/1Va0hey>

A floating home in Amsterdam



Image credit: Wojtek Gurak, <http://bit.ly/1nzqoRv>

Dr Alexander Erath
Senior Researcher, Future Cities Laboratory



Image credit: Centre for Liveable Cities

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*We are people
and we need to
work together.
We need to have
the opportunities
to do so.*

”

**Dr. Alexander Erath
Senior Researcher,
Future Cities
Laboratory**

4 | COLLABORATE UPSTREAM

The Roundtable's participants agreed that researchers and policymakers should collaborate, so as to come up with new urban solutions that are specific and implementable. Several also highlighted that both sides are often starved for time. Researchers want to work on projects that produce publishable findings within a certain timeframe. Meanwhile, policymakers are usually grappling with several urgent problems at a given time. Hence, both parties may not have the bandwidth to participate in long-term research collaborations, especially if these projects have weak policy applications.

But sweet spots exist.

A. MATSim

The Multi-Agent Transport Simulation (MATSim) Toolkit Singapore was originally developed by the FCL. It makes use of new technologies and urban data to simulate individual travel patterns. Recognising the potential of MATSim, the Urban Redevelopment Authority (URA) and Land Transport Authority (LTA) collaborated with FCL to further adapt MATSim to Singapore's context.

Today, MATSim enables planners to glean interrelationships between land uses, transport supply and travel behaviour. With MATSim, planners are able to evaluate not only the present transport system, but also predict the likely impact of new infrastructure — such as a new MRT line — and new policies.

URA and LTA officers visit FCL regularly to learn how to use MATSim, and discover insights that FCL's researchers have gleaned from the model.

B. Future Urban Typologies

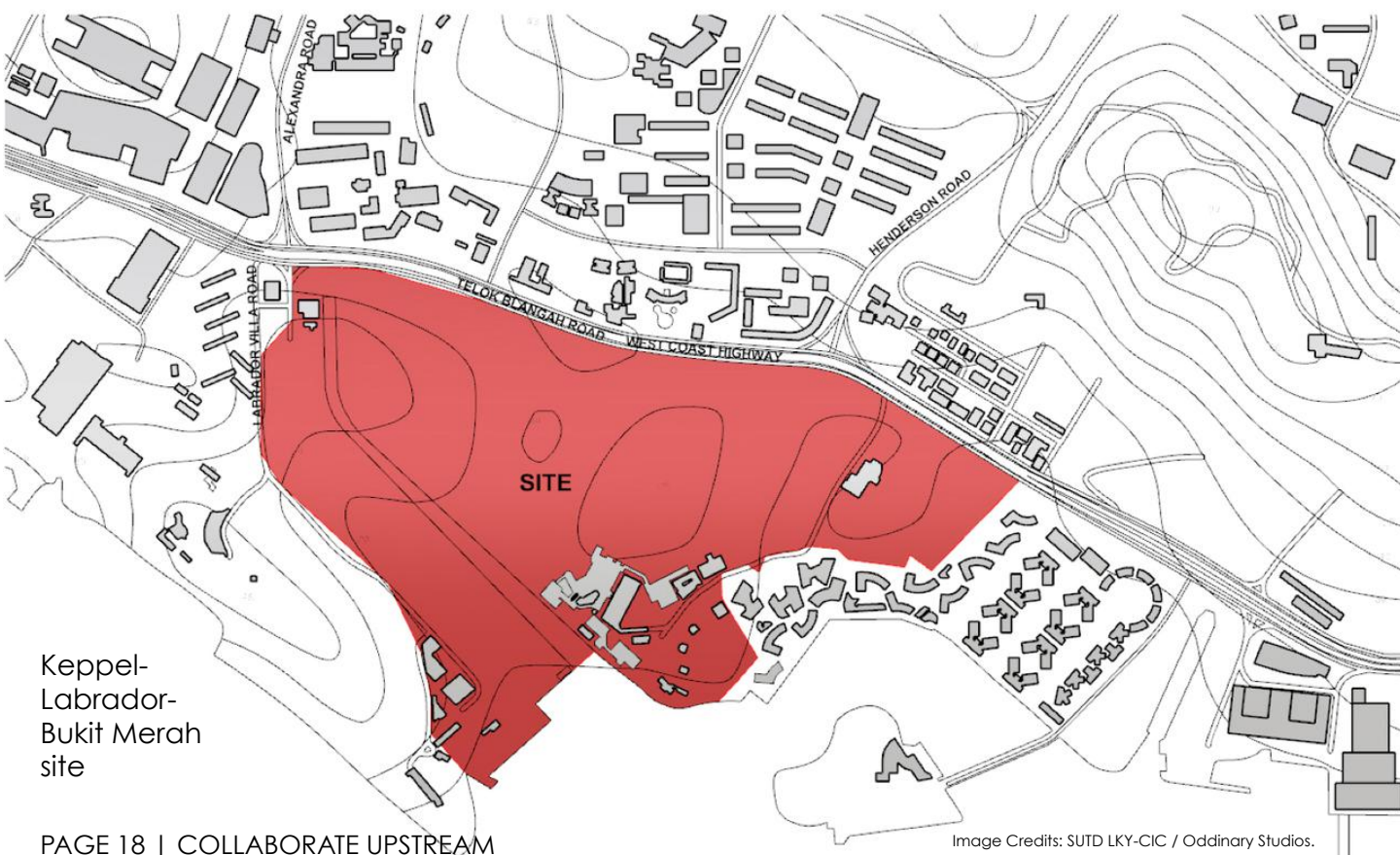
Another notable collaboration among the LKYCIC, FCL and URA explores innovative typologies for future urban living. The investigation, led by Professor Thomas Schroepfer at SUTD, engages directly in debates about how architecture, urban design and urban planning practices have to adapt to a larger and more diverse population, while respecting concerns about diversity, inclusivity, and environmental quality.

The project is deeply collaborative, with faculty researchers working closely with URA as well as SUTD students. URA was consulted during the early stages, and jointly determined the project's aims with the researchers. The agency also provided a test site for the investigation—a 64-hectare piece of land at the Keppel-Labrador-Bukit Merah area.

The site is unique as it combines strips of land with very different characteristics. These include contaminated land previously occupied by an oil refinery, the ecologically diverse Belayer Creek, a secondary forest and conserved Black & White bungalows at Bukit Chermin, and a golf course.

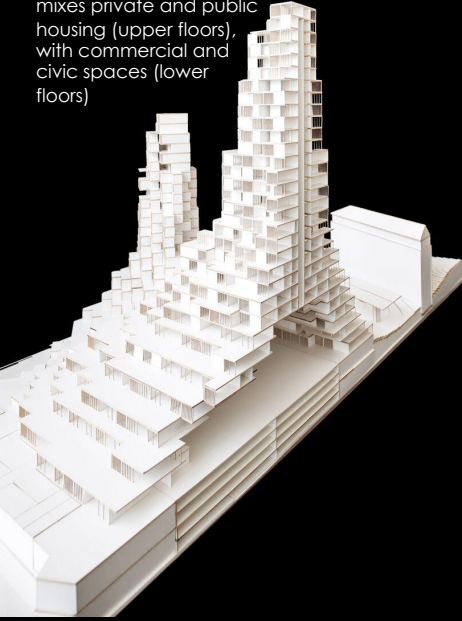
In this project, researchers and students conducted extensive mappings and analyses of the site and identified existing buildings, vegetation types and hotspots for biodiversity among other things. Based on these ecological factors, they envisaged the building typologies that would accommodate residential, civic and commercial uses in the parcel of land without compromising the natural value embedded in the site.

The investigation is now in its penultimate phase, and is expected to conclude in July 2016.

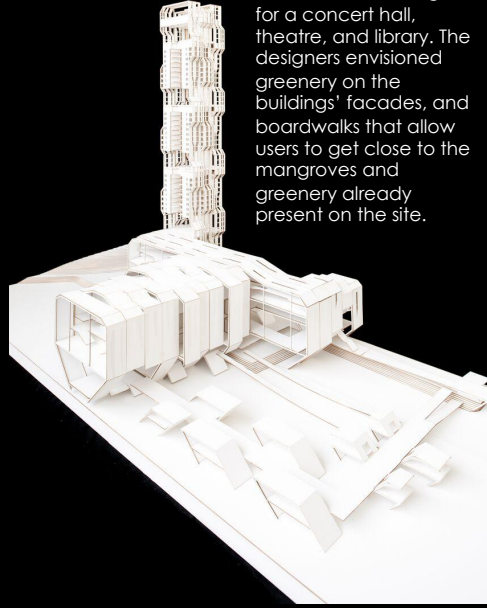


Future Urban Typologies For Enhancing Liveability In Singapore

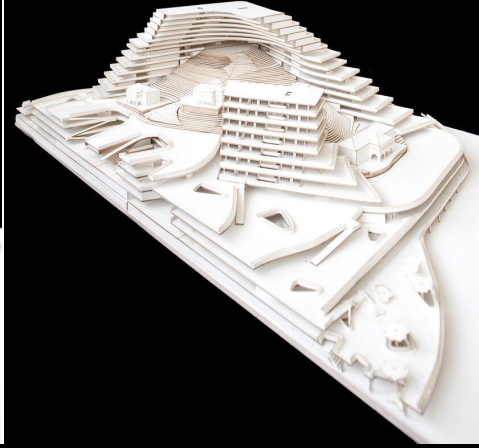
Urbanature takes mixed-used to a new level to support inclusive and liveable communities. It mixes private and public housing (upper floors), with commercial and civic spaces (lower floors)



Stitching Green stitches nature into commercial and civic uses. It features a hotel tower, and low rise buildings for a concert hall, theatre, and library. The designers envisioned greenery on the buildings' facades, and boardwalks that allow users to get close to the mangroves and greenery already present on the site.



Urban Landscapism combines the old with the new. Buildings for hotels, housing and retail co-exist with the Black and White bungalows on the site.



The big picture



Images credits SUTD LKY-CIC / Ordinary Studios

Professor Stephen Cairns,
Programme Director, FCL



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One of the great things about this forum is that it brings the experts, and **experts across disciplines.**

”

Professor Stephen Cairns
Programme Director, Future Cities Laboratory

5 | INNOVATE ACROSS TO ACHIEVE MULTIPLE GOALS

City governments are aware that they have to innovate their way out of urban challenges such as land scarcity, climate change and congestion. Most governments know how to do this. They could adapt and apply tools, techniques and technologies that have worked for businesses and in other cities. Additionally, governments may discover unexpected solutions when problems are reframed.

New technologies

One promising area for innovation is in the area of mobile-phone transport apps. Today, these applications focus overwhelmingly on moving small numbers of people in taxis or private cars. "How selfish is that use of space? Can't we use the space for 20 people?" Lui Pao Chuen, Advisor to the National Research Foundation, asked.

Lui suggested that policymakers and businesses could develop ride-sharing applications that facilitate the movement of more people in on-demand buses. For this mode of transport to work, these buses have to be cheaper than taxis, faster and more reliable than public buses, and commercially viable. Singapore has made inroads into this. In August 2015, the Infocomm Development Authority (IDA) and LTA launched a mobile phone application, *Beeline SG*, which allows commuters to book seats on express private bus routes. The agencies will be piloting this travel concept until the first quarter of 2016, after which it will assess whether the concept can be more widely applied.

New frames

Cities can also innovate by reframing their urban challenges. Today, developers often invest in sky gardens and vertical greenery to compensate for the natural greenery lost to make way for development. But the former tend to be inferior substitutes for the trees that were felled to make way for the buildings.

In addition, the shade from new buildings can reduce the amount of light available for photosynthesis, thereby reducing the performance of existing green spaces. In a recently published paper, Associate Professor Tan Puay Yok, and Mirza Rifqi Bin Ismail found that the shade cast by high-rise and high-density buildings in Singapore's residential estates have almost halved the daily light

available for photosynthesis. This reduction of sunlight correlated with lower vegetative and reproductive growth of some species of shrubs, and the increased slenderness of some tree species.

Lui contended that building with nature requires architects and developers to design buildings with the preservation of trees and vegetation as their starting points, instead of people or functions. In other words, the challenge is not how to incorporate new greenery to a new building, but rather, how to develop a building without undermining existing greenery. "If I designed a building with trees as a starting point, you will have quite a different looking building," Lui said.



Image credit: Centre for Liveable Cities

Lui Pao Chuen, Advisor, National Research Foundation

The Beeline Experiment

In Singapore, about 66% of all commuter trips during peak hours are made via public transport. On one end, taxis, provide the most direct form of travel. But they make inefficient use of scarce road space and can be costly to passengers. At the other end, buses and trains move large numbers at a relatively low cost to passengers. But they run on fixed routes and make multiple stops.

How can we achieve our objectives of fast travel, space efficiency, affordability, and commercial viability? In August 2015, IDA and LTA piloted the Beeline scheme to find out if demand-driven, and shared private transportation could offer a solution.

Beeline SG is Singapore's first mobile app that enables users to pre-book seats in express bus services. These buses are privately operated and ply high demand routes that are identified using big data on travel patterns, and crowdsourcing.

Each route has no more than five pick-up stops to ensure that journeys are direct and faster than using public buses. They are also cheaper than taxis with private operators offering an introductory fare of SGD 4 to SGD 6 per trip, and discounts for every five days booked.

Beeline is a public-private co-creation. While IDA and LTA facilitate the provision of data and technology, the express bus services are planned and operated by private providers. In addition, the scheme brings together experts across disciplines including data science, software development, interactive design, and transport operations, to re-frame and address the challenges in transport planning and provision.

A review of the pilot is set to take place in early 2016 to examine whether the scheme can be scaled up to serve more users.

How does Beeline work?

1 YOU SUGGEST



Suggest a route.
Tell us which routes you want.

2 WE ANALYSE



Beeline will analyse this crowd-sourced data with existing transport data to identify popular routes.

3 EVERYONE RIDES



Private bus operators are asked to run the route. Once activated, you can book a ride.

Image credit: Beeline Singapore, <https://www.beeline.sg/>

PART II: COLLABORATIONS

Urban System Challenges

Our cities have to adapt to shocks and stresses. That is the recurrent message expressed in numerous reports, books, studies, and conferences about cities. We are reminded that challenges such as the impact of climate change, rapid population growth, ageing infrastructure, as well as income and spatial inequalities are multi-dimensional. They require integrated solutions, and collaboration between multiple stakeholders, including government agencies, research institutions and private enterprises.

The Roundtable participants concurred that local government agencies and research institutions could collaborate more. “We want to be highly collaborative in our work,” said Professor Marty Dunn, Associate Provost for Research at SUTD. “SUTD already brings together people from engineering, architecture, computer science, and social science. But, we also want to be collaborating with other universities, companies and government agencies.”



Dr Limin Hee, Director for Research, CLC

Image credit: Centre for Liveable Cities

Dr. Limin Hee, who is the Director for Research at CLC, also emphasised collaborations. “The research community is really strong... there is deep work being done for various areas,” she said. “But there is also a need to bring multi-disciplinary teams together to address some of the challenges that we think would make big impact on how we live and work in the future”.

She urged researchers to partner policymakers to develop and test solutions to complex urban challenges that Singapore is facing. CLC hopes that future Roundtables can focus on urban solutions to one or two of the following challenges:



Professor Marty Dunn, Associate Provost for Research, SUTD

Image credit: Centre for Liveable Cities

Rethinking Singapore's Western Region. Today, Singapore's western region is zoned almost entirely for industrial use. It is sparsely populated, making it unprofitable for public transport operators to provide good transport connections to the area. Can the western region be transformed into a work-live-play environment that is dense, clean, and liveable?

Building a City with Nature. We have about 8,000 kilometres of waterways, 17 reservoirs, 300 parks and four nature reserves. But most of our water bodies remain covered in concrete. Likewise, a significant amount of our green cover happens to be on military land, and hence inaccessible to most members of the public. What are the possibilities of turning Singapore into a city of gardens and waters?

Planning for more Liveable Local Communities. In response to Hurricane Sandy, the US Department of Housing and Urban Development launched a design competition, Rebuild by Design. It aimed to develop innovative and implementable solutions that responded to the US East Coast's most complex needs. The competition was research-intensive, deeply collaborative, and involved diverse stakeholders including funders, NGOs, government agencies, universities and citizens. Seven out of the 10 design ideas have been implemented. How can Singapore develop similar platforms to address pressing community challenges?

Car-Lite Lifestyle. Roads and transport infrastructure already occupy about 12% of Singapore's land area. How can we make active mobility options such as walking and cycling the preferred mode of travel? How can we reconfigure our cities as roads and parking spaces become available for other uses?

Living with Diversity. Singapore's population is growing more diverse, and older. How can we design and build our environments to maximise social and spatial equity?

CONCLUSION

The central theme of the fourth Cities Roundtable was that our cities are facing a range of stresses, including disruptive new technologies, demographic changes, and the effects of climate change. The two main solutions that emerged during the Roundtable were timeless ones – good urban governance, and more collaboration among different players to arrive implementable solutions.

Where governance is concerned, the keyword is “enabling”. Governments can develop regulatory environments and infrastructure that support new technologies and forms of businesses. They can also enable researchers by sharing urban data with them, as Singapore has already begun to do, for example, with Virtual Singapore – a dynamic three-dimensional city model and collaborative data platform. With better data, researchers and urban experts can more effectively share the responsibility of identifying patterns and phenomena that warrant further attention and policy responses.

We also need to work together. This means forging meaningful partnerships between multiple stakeholders from across many disciplines. One example is the collaboration between URA, LKYCIC and FCL to investigate future urban typologies that would enhance liveability, equity and resilience in high-density communities. The project’s objectives were jointly determined by public officers and researchers. In addition, the research team itself is multi-disciplinary, leveraging the expertise of engineers, social scientists, designers and architects.

Pooling together the skills and experiences of such a multidisciplinary group shows strong recognition that collaborative teams—with skill sets that are almost as diverse as cities themselves—are needed to mould a brighter future for cities. Cities have always been complex, dynamic and continuously challenging. But with strong partnerships, an openness to new approaches and new technology, the next stage in the evolution of cities and city-living looks to be an exciting one.

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