

City Design and Sustainable Environment

Smarter Healthy Cities Beyond COVID-19
The 9th Global Conference of the Alliance
for Healthy Cities, the China Hong Kong
Chapter of the Alliance for Healthy Cities

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Today Sharing

- Sustainable Environment
 - Hong Kong Vision
 - Greenhouse Gas Emissions in HK and Why Green Buildings Matter
 - Some Targets and Approaches
- Humanizing City Design
 - Building City with Heart
 - Housing unaffordability, congestion, and “behavioral sink”
 - City design to address community needs

Hong Kong Sustainability Vision

Zero-carbon Emissions

Liveable City
Sustainable Development

Achieve carbon neutrality before
2050

\$240 billion on climate change
mitigation and adaptation

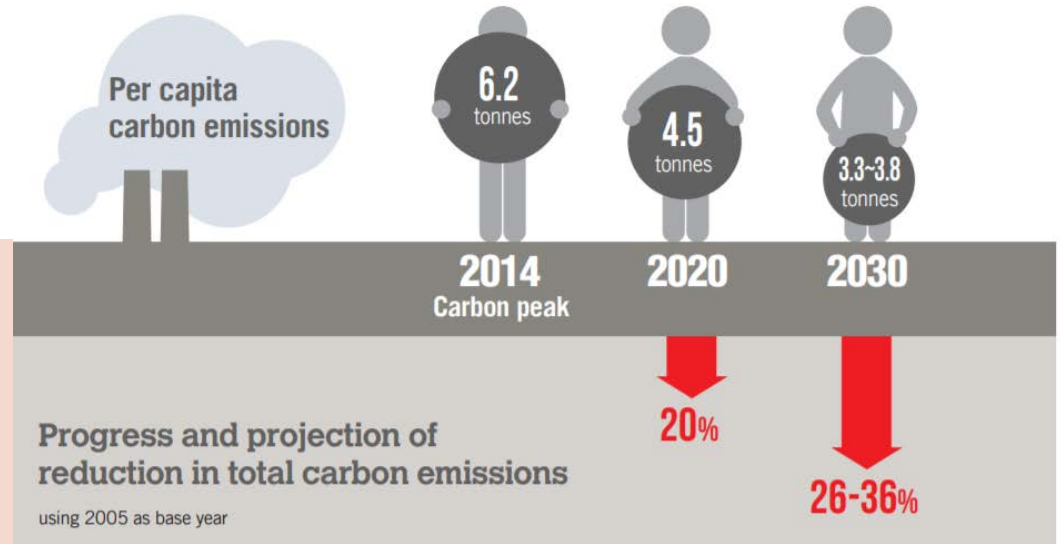
香港邁向
碳中和
Carbon Neutral@HK





The Net Zero Challenges

Hong Kong's carbon emissions reached its peak in 2014 - per capita carbon emission of 6.2 tonnes



Sources: https://www.climateready.gov.hk/files/pdf/CAP2050_booklet_en.pdf

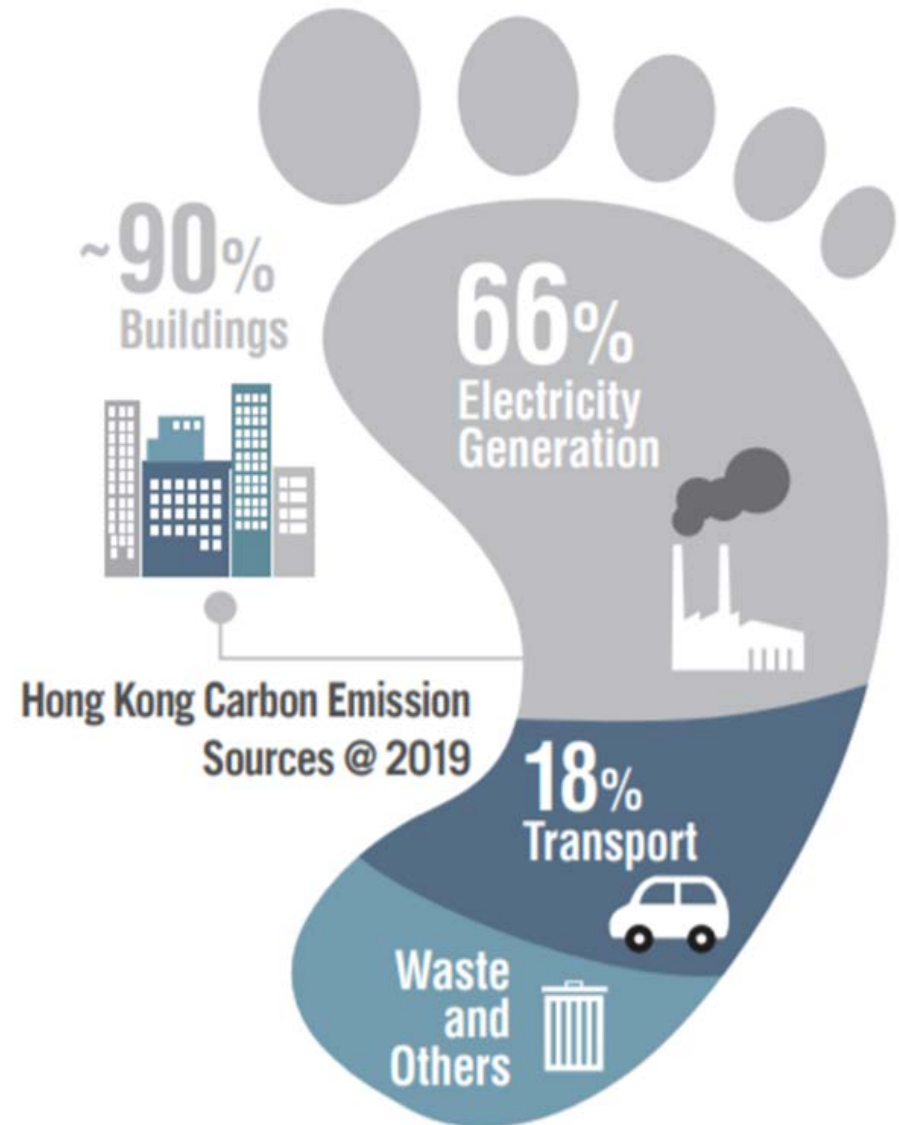
Greenhouse Gas Emissions in HK by Sector

	Electricity Generation and other Energy Industries	Transport	Other End Use of Fuel	Waste	Industrial Processes and Product Use	Agriculture, Forestry and Other Land Use	Total
2019	26,300 (65.7%)	7,230 (18.1%)	1,830 (4.6%)	2,940 (7.3%)	1,710 (4.3%)	28 (0.1%)	40,100 (100%)

Data Source: <https://www.climateready.gov.hk/files/pdf/Greenhouse%20Gas%20Emissions%20in%20Hong%20Kong%20by%20Sector.pdf>

The Biggest Three Carbon Emission Sources

1. Electricity
2. Transport
3. Waste



4 Major Decarbonization Strategies

Net-zero electricity generation

- No more coal for electricity generation
- Increase the use of renewable energy to 7.5 per cent to 10 per cent by 2035, and to 15 per cent thereafter
- Achieve net-zero electricity generation before 2050.

Energy saving and green buildings

- Reduce the electricity consumption of commercial buildings by 30% to 40% from the 2015 level by 2050
- Reduce the electricity consumption of residential buildings by 20% to 30% from the 2015 level by 2050
- Achieve half of the above reductions by 2035.

Green transport

- Cease the new registration of fuel-propelled and hybrid private cars in 2035 or earlier
- In the next three years to test out hydrogen fuel cell electric buses and heavy vehicles
- Achieve zero vehicular emissions and zero carbon emissions in the transport sector before 2050

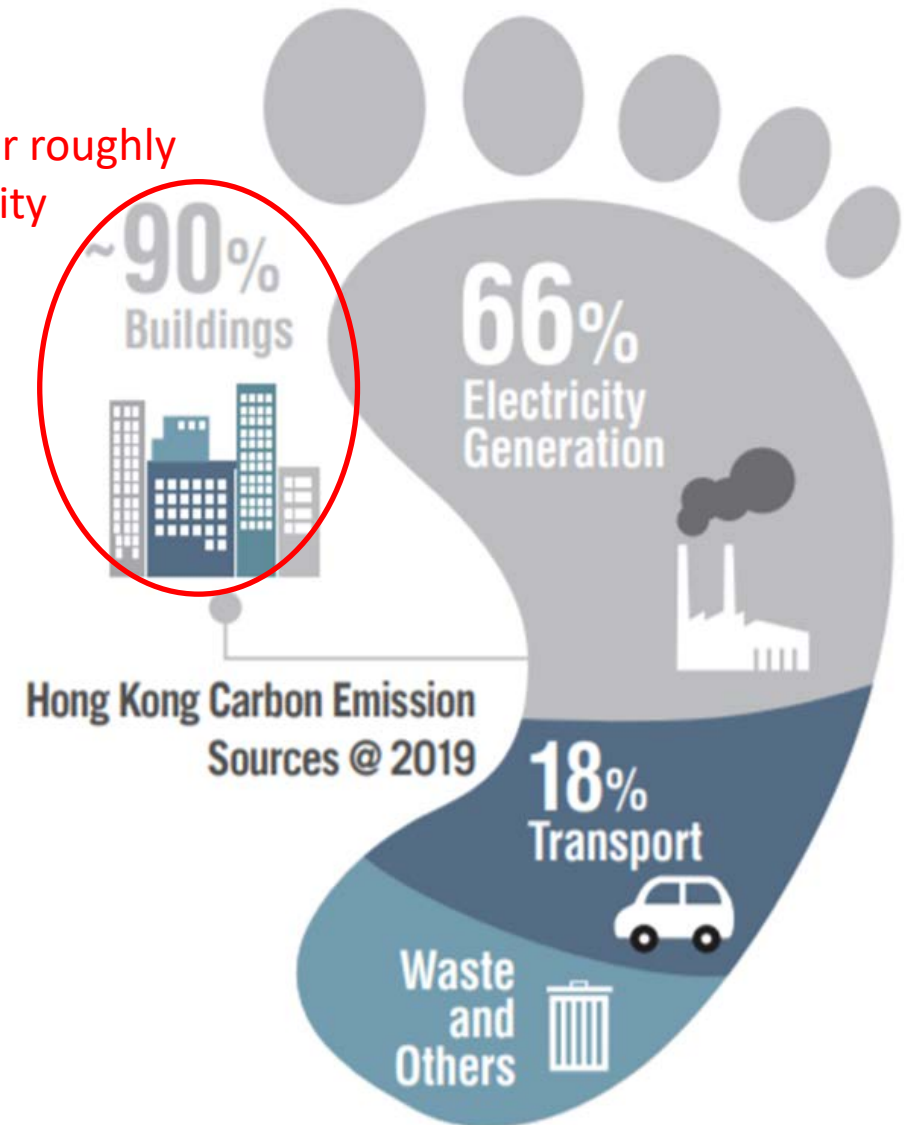
Waste reduction

- Develop adequate waste-to-energy facilities by 2035 and not to rely on landfills for municipal waste disposal
- Implement waste charging in 2023 and regulate disposable plastic tableware in phases from 2025 onwards
- Carbon neutrality in waste management before 2050

Why Buildings Matter

1. Electricity Generation
2. Transport
3. Waste

Buildings account for roughly 90% of total electricity consumption in HK



Green Buildings Decarbonization Targets

- Reduction of energy intensity by 40% per cent by 2025
- Electricity consumption reduction from the 2015 level by 2050
 - Commercial buildings by 30% to 40%
 - Residential buildings by 20% to 30%
- Achieve half of the above reductions by 2035.

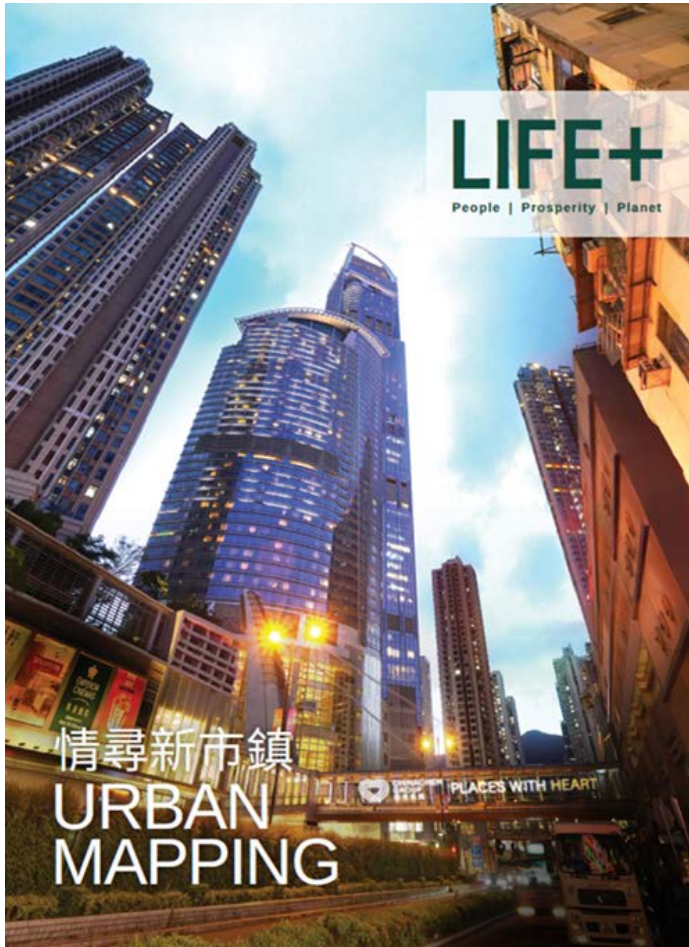




Buildings' Energy Efficiency Ordinance and Green Finance

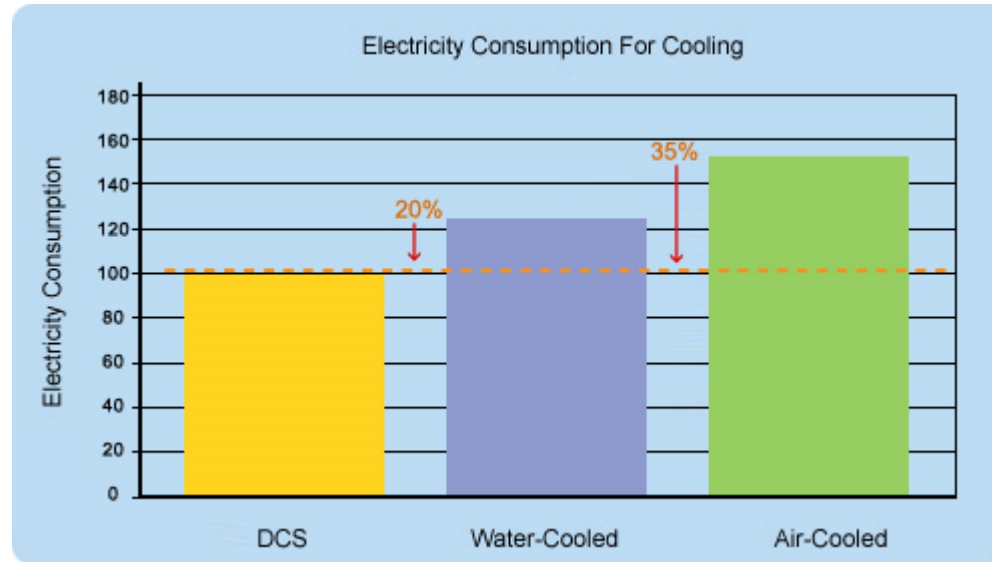
- Buildings Energy Efficiency Ordinance (Cap. 610) regulates the energy efficiency standards of four key type of building services installations --- air-conditioning/Lighting/electrical installations/lifts and escalators
- Mandatory Energy Efficiency Labelling Scheme (MEELS) covers eight types of electrical products/appliances which account for about 50% of the energy consumption in the household
- Retro-commissioning (RCx)
- Issue green bonds totaling \$175.5 billion in five years from 2021-22
- Green Tech Fund and the Cleaner Production Partnership Programme

Zero Carbon Emissions · Smart Healthy City



District cooling system

- Kai Tak Development Area
- Tung Chung New Town Extension (East)
- Kwu Tung North New Development Area



Source: https://www.emsd.gov.hk/energyland/en/building/district_cooling_sys/dcs_benefits.html

Building City with Heart

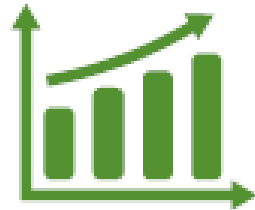


City Design is about People



PEOPLE

To engage and respect all people as stakeholders
To encourage and nurture diversity
To create a culture of inclusiveness in communities



PROSPERITY

To deliver economic benefit that meets the community's current and future needs in a safe, equitable and sustainable manner, and to make our city more liveable and sustainable for all



PLANET

To integrate environmental considerations into all aspects of city planning, design and operations for minimizing resource and energy consumption as well as reducing the environmental impacts

Humanizing City Design

Humanize meaning

“To make something less unpleasant and more suitable for people”

– Cambridge Dictionary

“Humanizing cities is one of the concepts that seek to **improve a city’s living conditions for its citizens.**”

- THE FIRST INTERNATIONAL CONFERENCE ON HUMANIZING CITIES



An aerial photograph showing a dense grid of high-rise apartment buildings in Hong Kong. The buildings are packed closely together, with a mix of grey and brown facades. The windows are small and numerous, creating a repetitive pattern across the entire frame. The perspective is from directly above, looking down on the city's verticality.

**For 11th year, Hong Kong remains
the least affordable housing market in the world**

**Home is getting Smaller
Public space is getting more Congested**

HK Living Area/Capita is the Smallest in Asia



How much space is enough?

Average residential floor space per capita in ft²



Note: data for 2009 builds, * China figures urban only, assumes average national household size

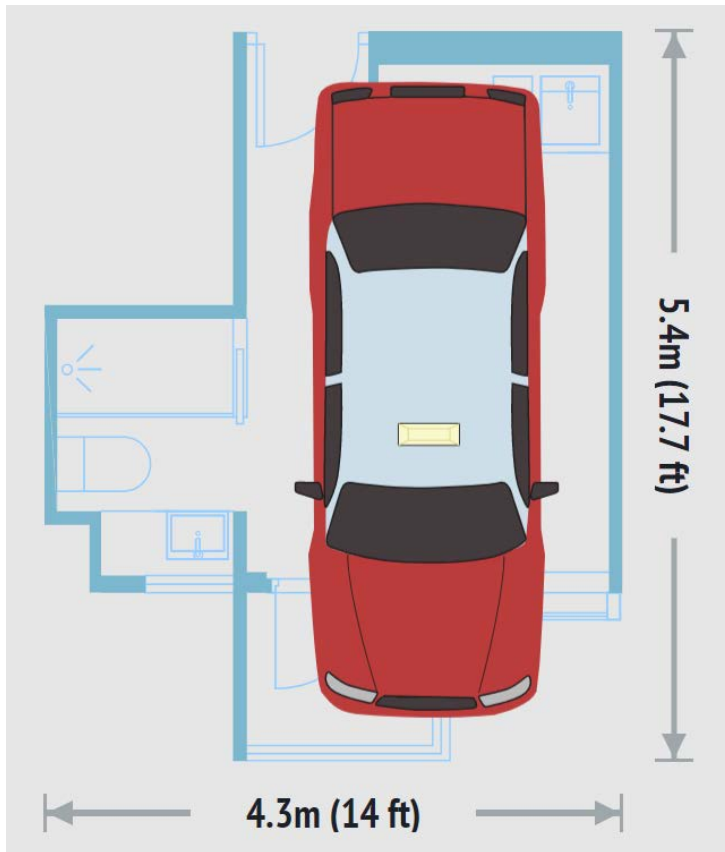
Sources: CommSec, RBA, UN, US Census

HK has one of the smallest living area/capita in the world shrinkthatfootprint.com

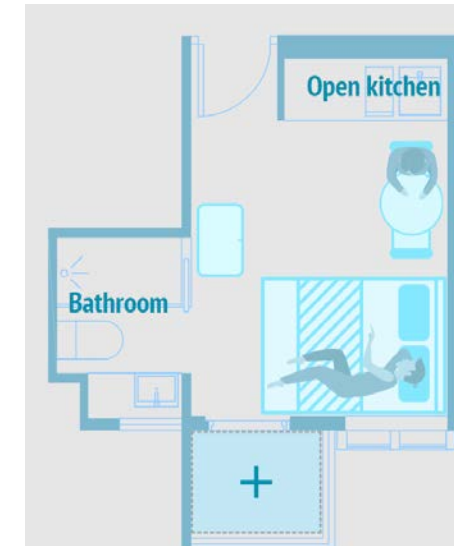
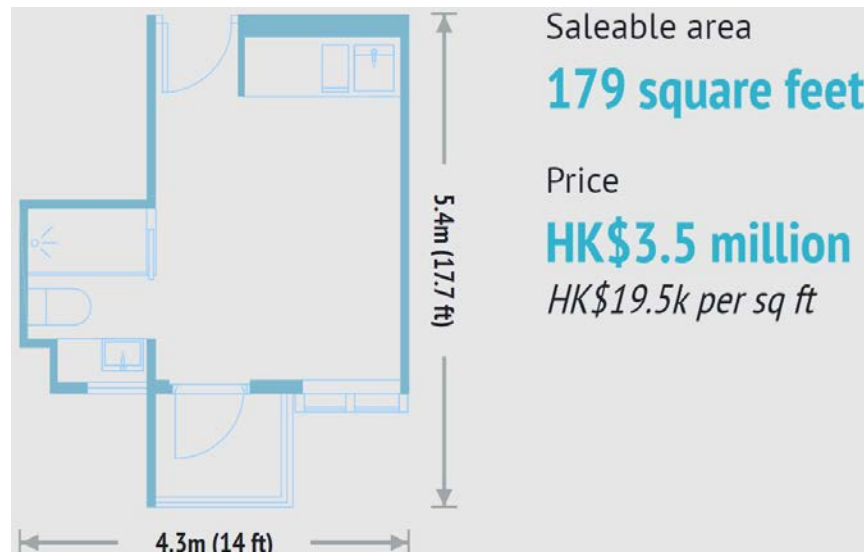
Unaffordability and Rise of 'Nano' Flats

smallest 128-sq-ft flat

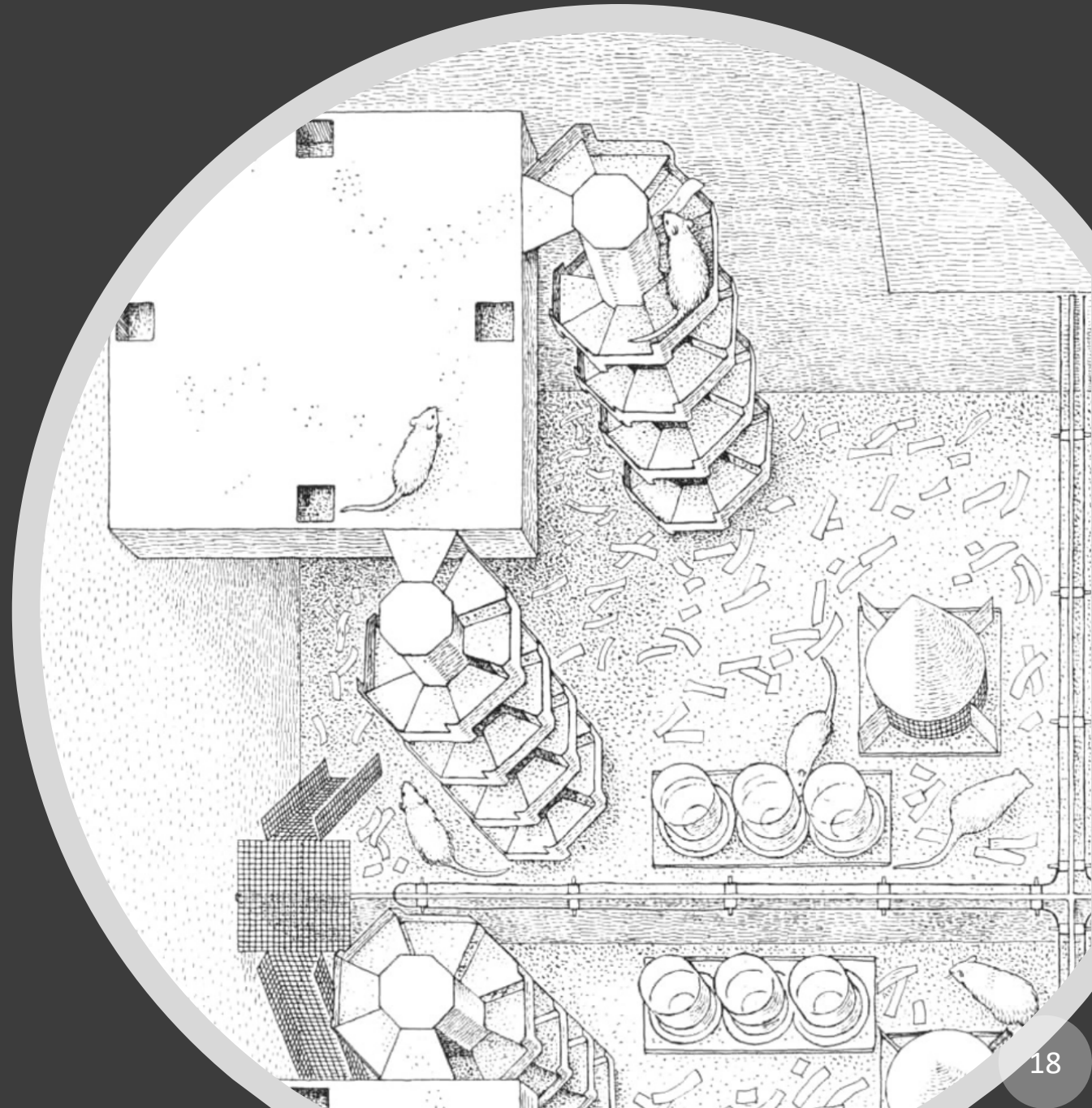
At the end of June 2021, there were about **254,600 applications** for public housing. Average waiting time for a general applicant is **5.8 years**



HK Average living area per person:	161 SF
Private housing:	194 SF
Government subsidized housing:	124 SF



The Problem:
Hong Kong is
becoming a
“Behavioral Sink”





‘Manhattanism’ goes sour *Delirious Hong Kong*

The psychology of physical space – crowding as a pathological condition

“When a population of laboratory rats is allowed to increase in a confined space, the rats develop acutely abnormal patterns of behavior that can even lead to the extinction of the population.”

- John B. Calhoun – “Population Density and Social Pathology”
Scientific American, 206 (3): February 1962

"Universe 25" – Utopia turned to hell



The Culture of Congestion

“No small part of this ugly barbarization has been due to sheer physical congestion: a diagnosis now partly confirmed with scientific experiments with rats – for when they are placed in equally congested quarters, they exhibit the same symptoms of stress, alienation, hostility, sexual perversion, parental incompetence, and rabid violence that we now find in the Megalopolis.”

– Lewis Mumford in *The City in History*, 1961, p 210



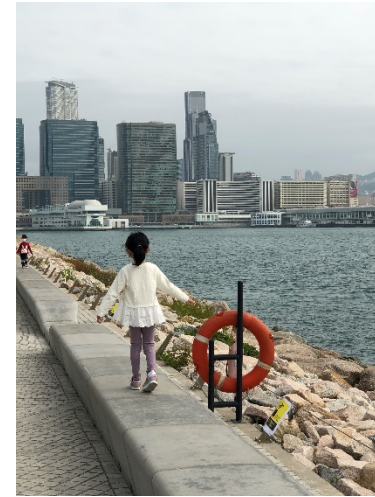
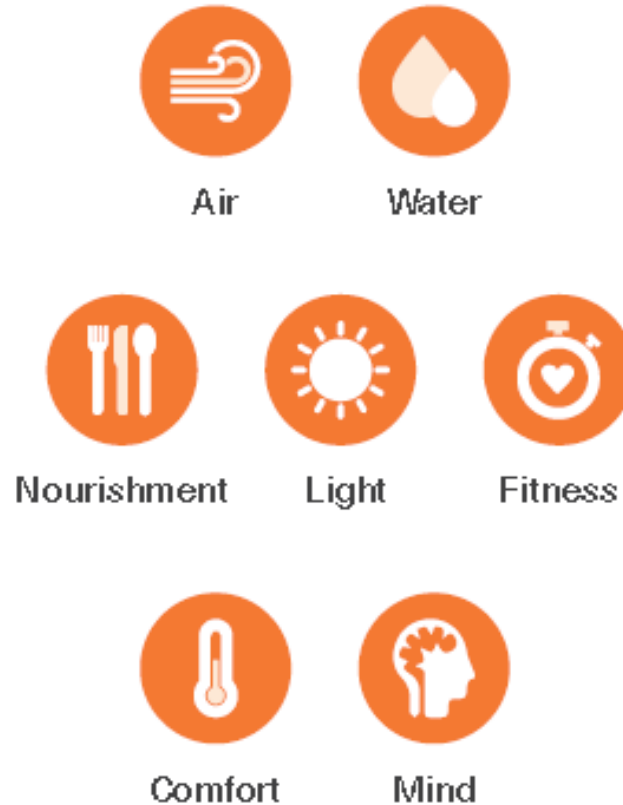
Hitting the bull's-eye for Hong Kong Future City Design

Asking the right questions to humanize Hong Kong

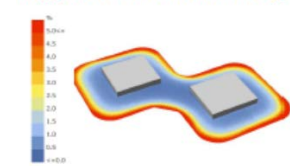


City Design to Address Community Needs

Healthy age-friendly and wellness city for all

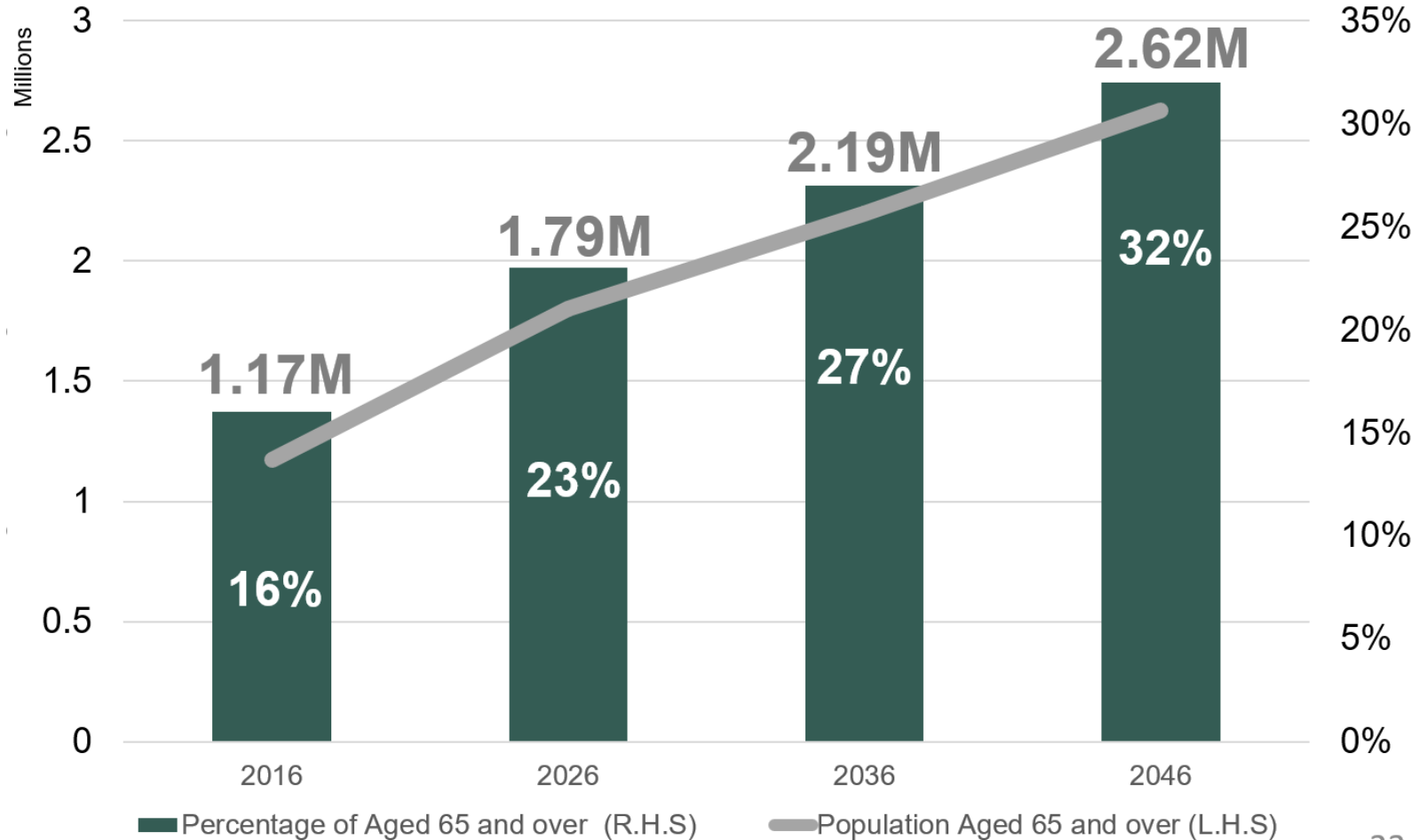


Daylight Factor Simulation & Curtain Wall Design



Source: Cundall Well Building Standards

The Needs of HK Rapidly Ageing Population



Source: Hong Kong Population Projections, Census and Statistics Department of HKSAR Government

The Needs of Ageing and Dilapidated Buildings

Residential Units Aged 70 and over	
In 2016,	In 2046,
1,100 units	326,000 units

➔ Speeding Up
Urban Renewal

Source: Planning Department of HKSAR Government Our Hong Kong Foundation and Urban Renewal Authority



Humanizing Building Design for People



Non-nano Flat



**Toilet With
Better Ventilation**



**Facilities
For All Ages**



**Green and Sustainable
Living Environment**

Humanizing City Design

Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services,

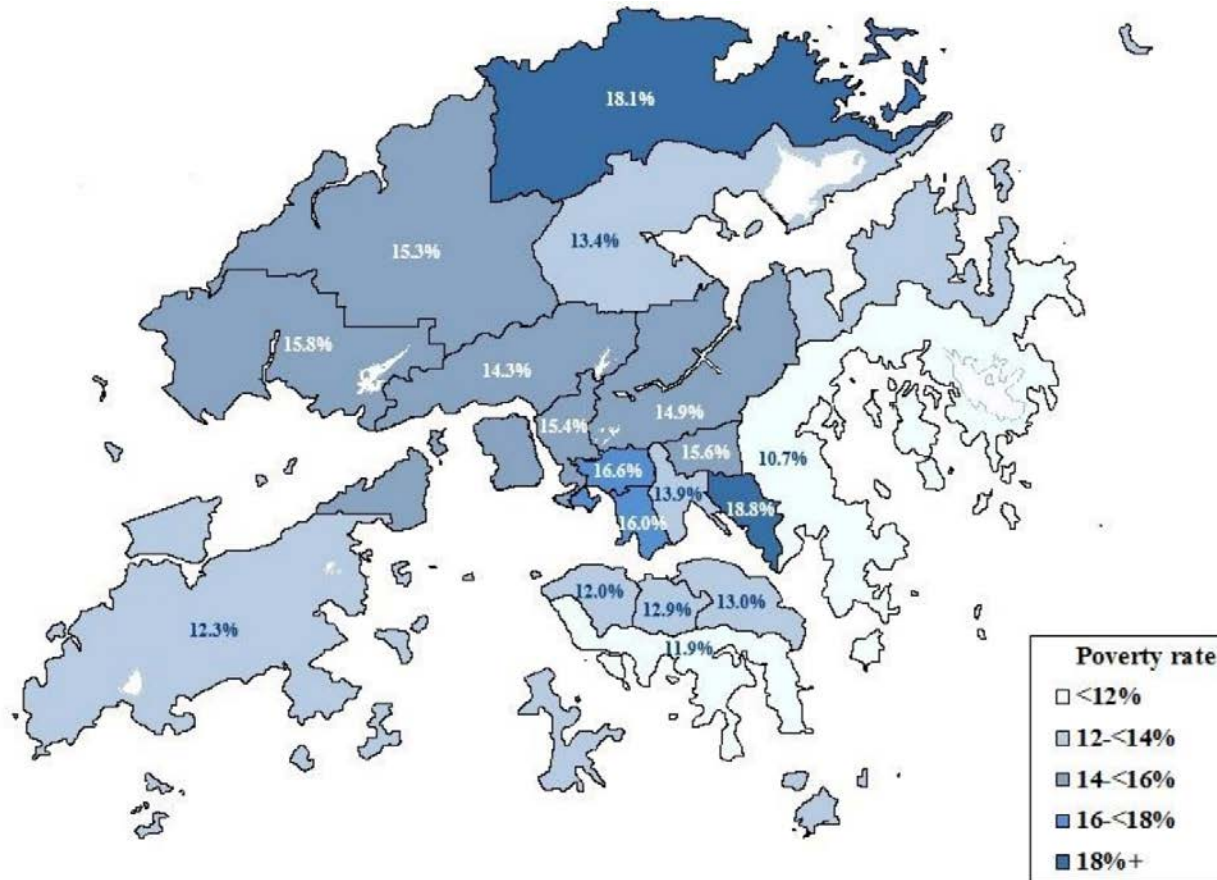
Universal Declaration of Human Rights (UDHR) adopted by the UN General Assembly in 1948. Article 25 (1)

**We need to build
our city for people**



The Needs to Eliminate Urban Gentrification

By District Council District based on poverty statistics after recurrent cash intervention



Source: Hong Kong Poverty Situation Report 2018

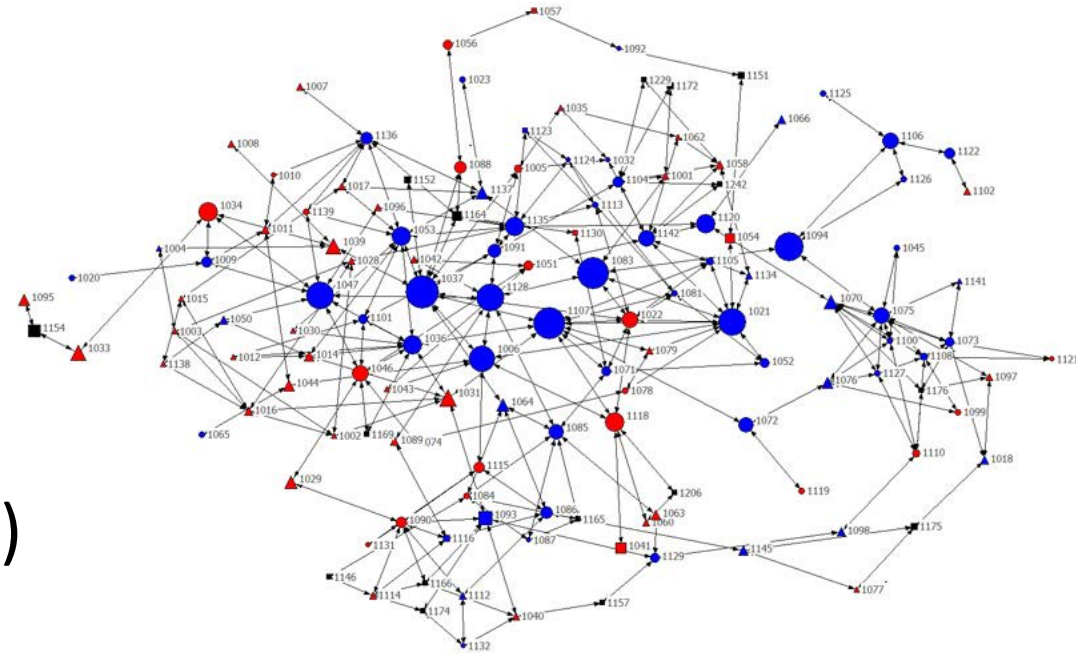


District Council district	Poverty rate (%)
Kwun Tong	18.8
North	18.1
Sham Shui Po	16.6
Yau Tsim Mong	16.0

Healthy City For ALL - Together We-Can

- **People:** Availability of human capital
- **Technology:** Infrastructure and Innovation
- **Institutions:** Collaborative but Diverse (one country, 2 systems)

HK- GBA Network Cities



Source of graphic: <http://www.ecologyandsociety.org/vol17/iss4/art11/figure9.jpg>