



OUR HONG KONG  
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# Re-imagining Hong Kong with a Game-Changer

Enhanced East Lantau Metropolis

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Research Report



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Executive  
Summary

**Hong Kong's future is shrouded by the city's widely-acknowledged land and housing challenges, which undermine our economic success and hinder our development.** While land supply is neither the only challenge nor a solution for all, lack of land is perhaps one of the few undisputed problems in the city. We need to get our act together to address this challenge and we need to do it soon. The facts are well-known:

- Real private housing prices have tripled since 2004, while real wages have barely grown at all. Meanwhile, the public housing queue has surged to a waiting time of 5.1 years, its highest for the past 18 years.
- Liveability continues to deteriorate due to high population density (27,400 persons per sq km, vs. 10,700 in Singapore and 7,400 in Shenzhen) and a lack of living space (per capita living space is at 170 sq ft vs. 270 sq ft in Singapore and 300 sq ft in Shenzhen).
- High population density has a detrimental effect on our health and well-being in urban areas, contributing to serious air pollution and noise pollution.
- Fast forward to 2046, Hong Kong's elderly population (>65 years old) will have doubled in size, while aged private housing units will have increased 300 times to 326,000 units. For an ageing population, we will need even more facilities and have to re-adjust much of our current infrastructure. Our land supply will simply be unable to cope with these longer-term demands.

**Hong Kong needs a new long-term vision – our government should adopt a forward-looking and liveability-centric mindset for our city's future development.** There are plenty of discussions and research being conducted on the topic already, including the latest consultation paper from the Task Force on Land Supply. From these various efforts, it is clear that there are no good short-term measures that will holistically address Hong Kong's land problem. The negligence of development over the past decade simply cannot be solved by any feasible measures in the immediate time-frame. And since many of our current discussions resort to discussing specific short-term ideas, they often miss the bigger picture. We need a holistic and proactive city planning vision based on the broader aspirations of liveability, urban planning and economic development.

**Of all the options under consideration today (which are detailed in the 18 options from the consultation paper by the Task Force on Land Supply), only the option of large-scale reclamation can create the foundations to bring a new vision to Hong Kong's development.** This is the only “game-changer” that will give us the opportunity to re-imagine Hong Kong, to set a new standard for our future quality of life, and give hope to future generations.

**Based on our research, we propose a 2,200-hectare reclamation in the Central Waters between Lantau Island and Hong Kong Island,** building upon the government's “East Lantau Metropolis” (ELM) plan detailed in its 2030+ proposal. We call this the “Enhanced-East Lantau Metropolis” (EELM) proposal. This man-made island can be connected to Mainland China and the rest of Hong Kong through three major road links, including one connecting to Kennedy Town, another to Lantau Link and a third to Mui Wo and then to Tuen Mun and the Hong Kong-Zhuhai-Macao Bridge. We also propose three new railway lines connecting to Kennedy Town, Mei Foo and Tuen Mun South, respectively. This is probably the most desirable location in Hong Kong where a critical reclamation of land mass can be developed. By doubling the size of the reclamation and creating an area half the size of Kowloon, this can create a land bank for Hong Kong's development for the next two decades.

**Early findings and research from engineering professionals have substantiated that the EELM proposal is financially, technically and environmentally feasible.** Factors such as water depth, marine traffic and operations, various land restrictions and submarine utilities have been thoroughly considered. While there is much work to be done, there are no “show-stoppers” for this reclamation.

**We have also examined the ecologically significant features of this part of Hong Kong,** and developed initial plans on how the wildlife and environmental features can be conserved. Our proposal has intentionally kept a 200 to 300-metre buffer distance between the EELM and existing islands to preserve the ecology and natural coastlines. As for our beloved Chinese White Dolphins and Finless Porpoises, the EELM site represents a rather marginal habitat for them as they have not been regularly sighted in the area. Nevertheless, we propose that a more holistic marine preservation plan be developed together with the Guangdong government to facilitate better preservation of their well-being.

**The EELM proposal has the potential to create a new city that can accommodate a population of up to 0.7-1.1 million people, as well as house new industries and recreational facilities.** With a preliminary proposal of 28-32% of the EELM land reserved for residential purposes, at least 70% of which is dedicated to public housing, this reclamation can help to reduce our population density and increase per capita living space.

### **This reclamation can bring about five “re-imaginings” for Hong Kong**

- **Re-imagining affordable housing:** Address long-standing housing issues, including long-term land supply, homeownership aspirations, and increase the average size of affordable public and private housing.
- **Re-imagining urban design and quality of living:** Enhance living standards and quality to showcase what a “future city” would look like, featuring pedestrian-friendly road designs to encourage walkability, large-scale implementation of environmental-friendly solutions, and adequate green and communal facilities.
- **Re-imagining the redevelopment of old Hong Kong:** Provide a large piece of decanting land to facilitate the relocation of residents and facilities to redevelop old Hong Kong (e.g., dilapidated areas, brownfield sites).
- **Re-imagining industry development:** Offer significant benefits for industries bottlenecked by a shortage of land and accommodate plenty of opportunities for innovation.
- **Re-imagining transportation and connectivity:** Enable strategic transport links between New Territories West, Lantau and Hong Kong Island West, with a location at the core of the “one-hour living circle” connection within the Greater Bay Area.

**Any large-scale development in Hong Kong is complex and requires significant time and societal consensus.** Given how long any large-scale project takes these days in Hong Kong, we need to explore whether this proposal can be “fast-tracked” to become reality. The land issue in Hong Kong is severe and there is little patience for solutions that are too long-term. We need to realise that the first phase of the actual reclamation process takes only four years – but our current processes and deliberation could take more time than what it takes to actually build it. The process will require close cross-bureau collaboration to ensure efficiency; with strong advocacy, conviction and leadership from the very top of the

administration. It will also require a united vision of “a better Hong Kong” from all stakeholders, including the support of the Hong Kong citizens, at large.

**There is too much at stake to delay this holistic and large-scale project.** Many of our neighbouring Asian cities have been proactively developing capacity and land supply for years. They have developed their vision for their city of the future and how they can potentially become the best liveable city in the region. We are already behind in terms of creating new land capacity. This has led to our current predicament. We should have the vision to re-imagine our city, to fundamentally change our attitude and methods towards planning, to have an “urgency mindset” that will push us to immediately start working on a plan that will bring about mid-to-long-term benefits for Hong Kong. The alternative is that all of us continue to suffer more of what we have been going through in the past decade.

Let's change the game.

Let's re-imagine Hong Kong.

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**Research Report**



**Infographic Summary**



**Q&A Guide**



**Video**





Chapter 1

# A New Vision for Hong Kong

By many economic indicators, Hong Kong today is performing exemplarily – unemployment rate is at a record-low, GDP is growing steadily, and the city has been ranked as the world’s freest economy for the 24th consecutive year<sup>1</sup>. However, **this good performance has been overshadowed by the city’s land and housing challenges throughout the past decade**. For instance, Hong Kong ranks 71st worldwide and 7th in Asia in Mercer’s Quality of Living Survey 2018<sup>2</sup>, while Singapore, by contrast, ranks 25th worldwide and 1st in Asia. Despite ongoing investment in infrastructure and innovation, Hong Kong’s ranking is dragged down by deteriorating living standards, exacerbated by high housing costs, as well as social and political uncertainty. The course of Hong Kong’s future development has reached a serious bottleneck, which threatens to derail our economic success.

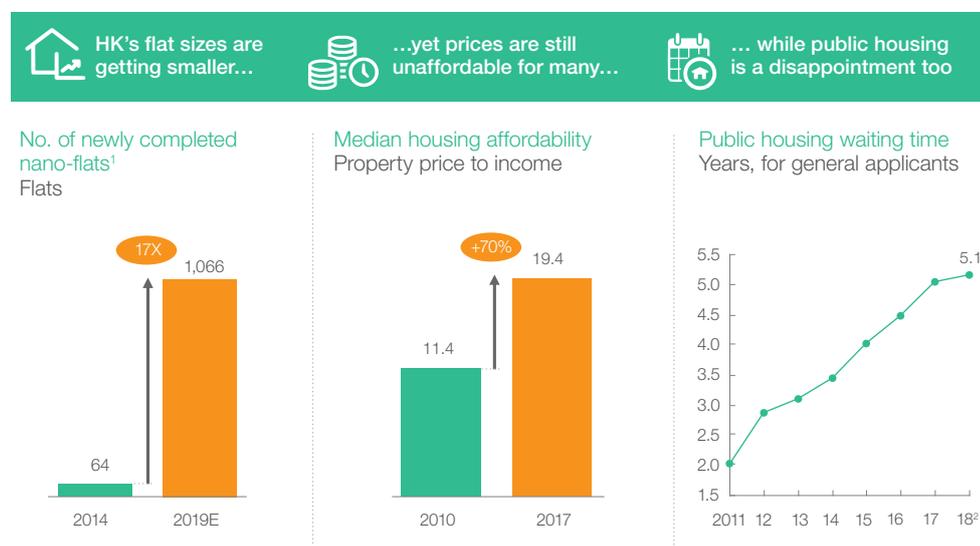
## THE DISTORTED HOUSING MARKET

Hong Kong’s housing market is distorted, resulting in a lack of upward mobility in the housing ladder, as seen in Exhibit 1. Flat sizes are shrinking, as is evident from the proliferation of nano-flats, which are expected to increase 17 times from 64 units completed in 2014 to 1,066 units in 2019. Housing has become virtually unaffordable – the median multiple, a ratio which measures median property price against median income, has surged 70% from 11.4 in 2010 to 19.4 in 2017.

With homeownership rates sitting at only 48%, society is divided between the “haves” and “have-nots”. Among the “have-nots”, namely those who do not own property, the situation is even more dire for those desperately queueing up for public housing, the waiting time of which has soared to its highest level since 2000<sup>3</sup>.

Median housing price equals to nearly 20 years of average household income

### EXHIBIT 1



### HONG KONG'S HOUSING MARKET IS DISTORTED

Source: Rating and Valuation Department, Hong Kong Housing Authority

Note: (1) Nano-flats refers to units with saleable area less than 215 sq ft.  
(2) As of March 2018

<sup>1</sup> Liu, Y. (2018, February 03). Hong Kong Trumps Singapore Again to be World's Freest Economy. South China Morning Post. Retrieved from <http://www.scmp.com/news/hong-kong/economy/article/2131789/hong-kong-trumps-singapore-again-be-worlds-freest-economy>.

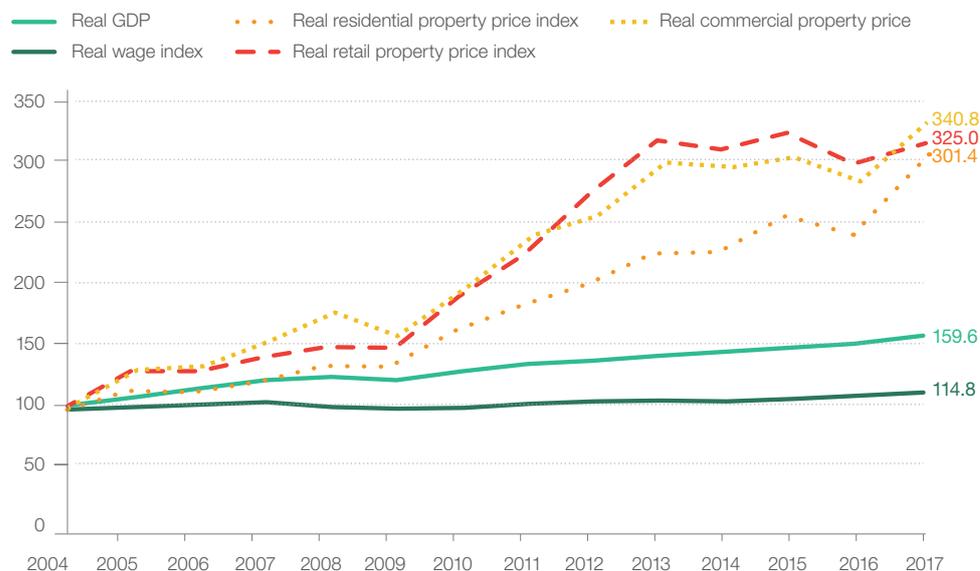
<sup>2</sup> Vienna Tops Mercer's 10th Quality of Living Ranking. (2018, March 20). Mercer. Retrieved from <https://www.mercer.com/newsroom/2018-quality-of-living-survey.html>

<sup>3</sup> 公屋輪候平均5.1年18年新高. TOPick Hong Kong Economic Journal. Retrieved from <https://topick.hketc.com/article/2071557/%E5%85%AC%E5%B1%8B%E8%BC%AA%E5%80%99%E5%B9%B3%E5%9D%875.1%E5%B9%B4%E3%80%8018%E5%B9%B4%E6%96%B0%E9%AB%98>

Real private property prices have grown **3** times since 2004

While most people are aware that Hong Kong's property prices are perpetually sky-high, not everyone understands the extent of the exorbitance. By comparing the growth in real wages, GDP and property prices in the past decade (Exhibit 2), we see that, astonishingly, while private residential property prices have tripled over the years, wages have only increased slightly. The case is even more severe for retail and commercial properties, which reflect rising business operation costs, creating a less than favourable business environment.

### EXHIBIT 2



PROPERTY PRICES, GDP AND WAGE INDEX, 100=2004 PRICES

Source: Census and Statistics Department

## POOR LIVEABILITY

Our population density is even higher than Mumbai - there are **27,400** people per each sq. km. of developed land in Hong Kong

As unaffordable housing has become the new normal, liveability continues to worsen and falls significantly behind other metropolises, especially the city's Asian neighbours (Exhibits 3 and 4).

- **Hong Kong is one of the most densely populated cities in the world.** Our city is famous for its compacted development model, given that only 24% of our total land area is built-up. However, this also results in a high population density of 27,400 people per square kilometre of developed land, double that of Singapore and London, 30% higher than New York, and even higher than Mumbai (i.e., 26,400 people).
- **The city's per capita living space also lags behind its neighbours at 170 square feet (sq ft),** as compared to 210 sq ft for Tokyo and 270 sq ft for Singapore. This situation is even worse for those living in subdivided units – their per capita living space only accounts for as little as 46 sq ft per person<sup>4</sup>. Among the 92,700 sub-divided units, over half are located in Kowloon, especially in old districts such as Yau Tsim Mong, Sham Shui Po and Kowloon City.

<sup>4</sup> Thematic Report: Persons Living in Subdivided Units (2018 January). Census and Statistics Department. Retrieved from <https://www.statistics.gov.hk/pub/B11201022016XXXXB0100.pdf>

- **The low quality of living is also evident from the lack of community land<sup>5</sup>**, such as open spaces and parks. The share of community land each person enjoys in Hong Kong is only 7 sq m, substantially lower than that in New York (25 sq m), Shanghai (20 sq m), and Singapore (9.6 sq m).

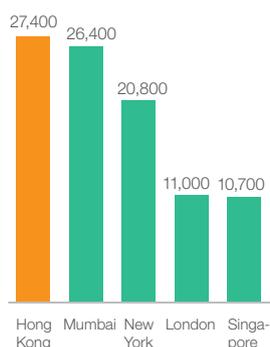
### EXHIBIT 3

Hong Kong is one of the most densely populated cities...

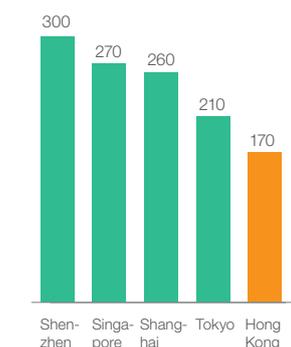
... and our per capita living space lags behind our neighbors...

... with one of the lowest per capita community land among Asian cities

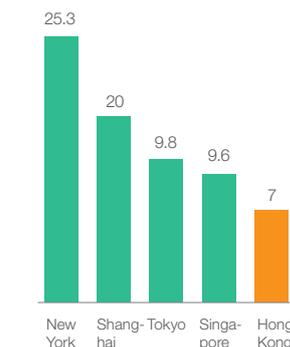
Number of persons per sq km of developed land, people



Living space per capita, Square feet.



Community land<sup>1</sup> per capita, Square metre



#### LAND SHORTAGE HAS BECOME A SIGNIFICANT ROADBLOCK

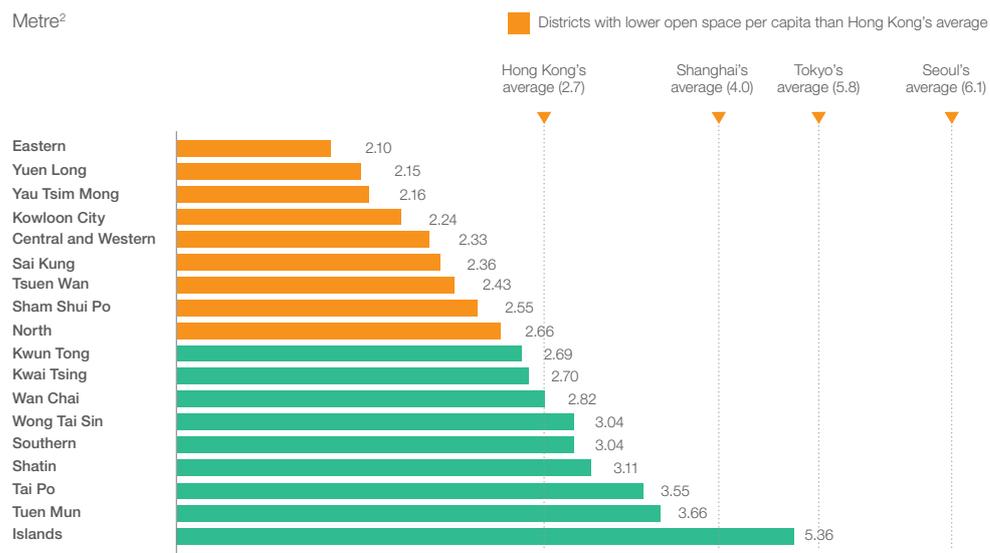
Source: Planning Department, Tokyo Bureau of Construction, Tokyo Metropolitan Government, Shanghai Statistical Yearbook, Singapore Department of Statistics, Statistical Year Book India 2017, Commission on Strategic Development

Note: (1) Including GI/C facilities (government, infrastructure and community), open space, parks etc., and excluding industrial and business land

**In terms of open space, Hong Kong has one of the lowest per capita open spaces among the major Asian cities** at 2.7 sq m per person, while Shanghai, Tokyo and Seoul are at 4.0, 5.8 and 6.1 sq m, respectively. This lack of open spaces is particularly serious in the old districts like the Eastern and Yau Tsim Mong districts, due to street block configuration constraints. These districts have even lower than average open space per person.

<sup>5</sup> Including GI/C facilities (government, infrastructure and community), open space, parks etc., and excluding industrial and business land

## EXHIBIT 4



### OPEN SPACE PER CAPITA IN EACH DISTRICT

Source: New York City Department of Parks and Recreation. Civic Exchange, Examination of Estimates of Expenditure 2017-18, DEVB(PL)375, Planning Department, Tokyo Bureau of Construction

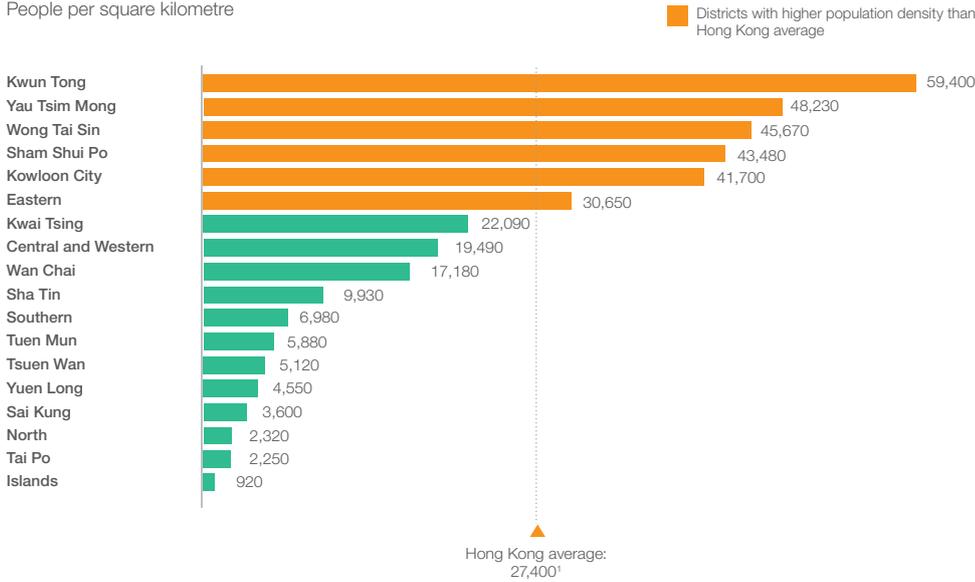
## ISSUES BROUGHT ON BY HIGH POPULATION DENSITY

**High population density has a detrimental effect on all facets of our daily lives,** such as traffic congestion, air and noise pollution. Kowloon residents, in particular, suffer from the harm brought on by high population density, especially in Kwun Tong, Yau Tsim Mong, Wong Tai Sin, etc., as seen in **Exhibit 5**. The population density here is more than double that of Hong Kong's average<sup>6</sup>, and Mong Kok at one point was even infamously recognised as the area with the highest population density in the world, attaining over 130,000 persons per square kilometre.

<sup>6</sup> Hong Kong 2030+ Paper: Topical Paper on Planning and Urban Design for a Liveable High-Density City. (2016, October). Planning Department. Retrieved from [http://www.hk2030plus.hk/document/Planning%20and%20Urban%20Design%20for%20a%20Liveable%20High-Density%20City\\_Eng.pdf](http://www.hk2030plus.hk/document/Planning%20and%20Urban%20Design%20for%20a%20Liveable%20High-Density%20City_Eng.pdf).

## EXHIBIT 5

People per square kilometre



### POPULATION DENSITY BY DISTRICT

Source: Census and Statistics Department

Note: (1) Hong Kong's average population density is derived from developed land per capita, while the population density by district calculated here is based on total land in each district per capita.

### An obvious result of high population density is severe traffic congestion.

Commuters spend an increasing amount of time in traffic, especially during the morning peak hours. Average car journey speeds have decreased by as much as 18% between 2006 and 2016, as seen in **Exhibit 6**.

## EXHIBIT 6

	2006	2011	2016	
NEW TERRITORIES	41.4km	40.2km	38.3km	-7%
KOWLOON	26km	24.2km	21.2km	-18%
HONG KONG ISLAND	22km	20.1km	20.2km	-8%

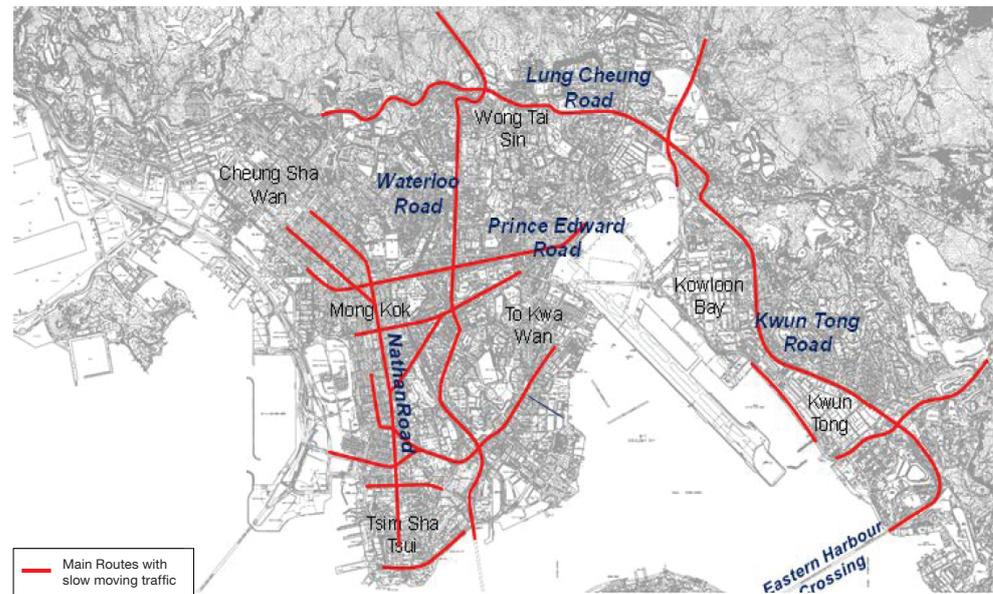
### AVERAGE CAR JOURNEY SPEED DURING MORNING PEAK HOUR

Source : Annual Transport Digest from Transport Department

Roads inside the Central Business District such as Des Voeux Road Central, Connaught Road Central and Charter Road have long been witness to an excruciating crawl as low and slow as 10 km/hour, as seen in **Exhibits 7 and 8**. The failure to provide new road capacity<sup>7</sup> to meet the ever-increasing travel demand over the past decade explains why congestion is increasing so rapidly.

The reason for this is obvious – lack of land resources. Hence, new road projects such as the Central–Wan Chai Bypass, currently under construction, and the Central Kowloon Route (part of Route 6), currently under planning, have to overcome these severe physical constraints by going underground. Opportunities for road development meanwhile become more and more scarce, particularly in the heavily built-up areas in the urban parts of Hong Kong Island and Kowloon.

## EXHIBIT 7

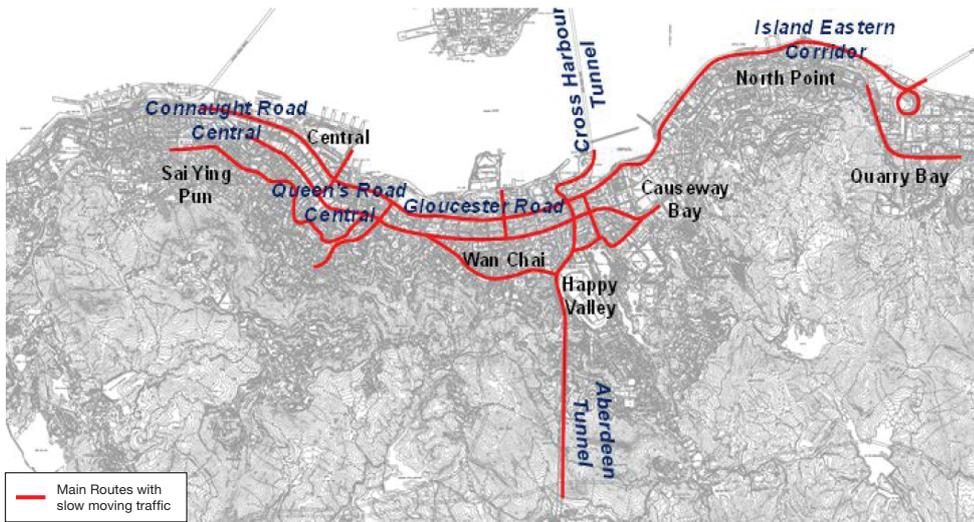


**ROAD NETWORK CONGESTION IN KOWLOON**

Source : Transport Department, Arup

<sup>7</sup> According to the Annual Traffic Census published by the Transport Department, the total road length of trafficable roads in the whole territory has increased by only 5% between 2006-2011, and the situation is the worst in Hong Kong Island, which has only seen an increase of 0.6% during the same period.

## EXHIBIT 8



### ROAD NETWORK CONGESTION IN HONG KONG ISLAND

Source : Transport Department, Arup

In an attempt to tackle the severe traffic congestion problem Hong Kong faces, government policy has focused on promoting the public transport system and positioning the railways as the backbone of that system, which now accounts for over 90% of total passenger trips by public transport. However, those travelling via railways have suffered as well. The average daily passenger journeys by rail have increased from 3.9 million in 2006 to 5.2 million in 2016<sup>8</sup>. The loading for most critical railway links (such as Kam Sheung Road to Tsuen Wan West on the West Rail Line) have reached near-full capacity or are at overcapacity, with the Tsuen Wan, West Rail, Island and Tseung Kwan O Lines reaching over 95% capacity during the morning peak hour<sup>9</sup>. By 2036, this over-capacity issue of the West Rail Line is projected to deteriorate to over 120%<sup>10</sup>, given the expected population increase in New Territories West when more housing developments are completed.

**While traffic and railway congestion might be side-lined as tolerable issues by some, it is not as easy to ignore the detrimental effects of high population density on our health in the form of air and noise pollution.** Roadside pollution levels remain high throughout the city. Nitrogen dioxide (NO<sub>2</sub>) levels were serious enough in the western parts of the city for unsafe measurements to be observed inside homes. In 2017, the roadside NO<sub>2</sub> concentration was at 85 micrograms per cubic metre (mcg per m<sup>3</sup>), over 20% short of the government's goal to lower levels to 65 mcg per m<sup>3</sup> by 2020<sup>11</sup>. The closely spaced buildings in urban areas are also a factor in reducing air ventilation and increasing pollutant dispersion, thus further affecting the local air quality in areas like the Yau Tsim Mong districts. Researchers

<sup>8</sup> Based on an established prima facie feasibility report from Arup.

<sup>9</sup> Tsuen Wan Line (102%), West Rail Line (104%), Island Line (96%), Tseung Kwan O Line (97%), based on loading per hour per direction under passenger density standard of 4 persons standing per square metre. Capacity and Loading of Trains in the MTR Network (2014, February 28). Legislative Council of Hong Kong. Retrieved from [https://www.legco.gov.hk/yr15-16/english/panels/tp/tp\\_rdp/papers/tp\\_rdp20160419cb4-854-7-e.pdf](https://www.legco.gov.hk/yr15-16/english/panels/tp/tp_rdp/papers/tp_rdp20160419cb4-854-7-e.pdf).

<sup>10</sup> The Draft Siu Ho Wan Outline Zoning Plan: TPB Paper No. 10374 (2018, May 1). The Town Planning Board. The Government of Hong Kong Retrieved from [http://www.info.gov.hk/tpb/en/papers/TPB/1160-tpb\\_10374.pdf](http://www.info.gov.hk/tpb/en/papers/TPB/1160-tpb_10374.pdf).

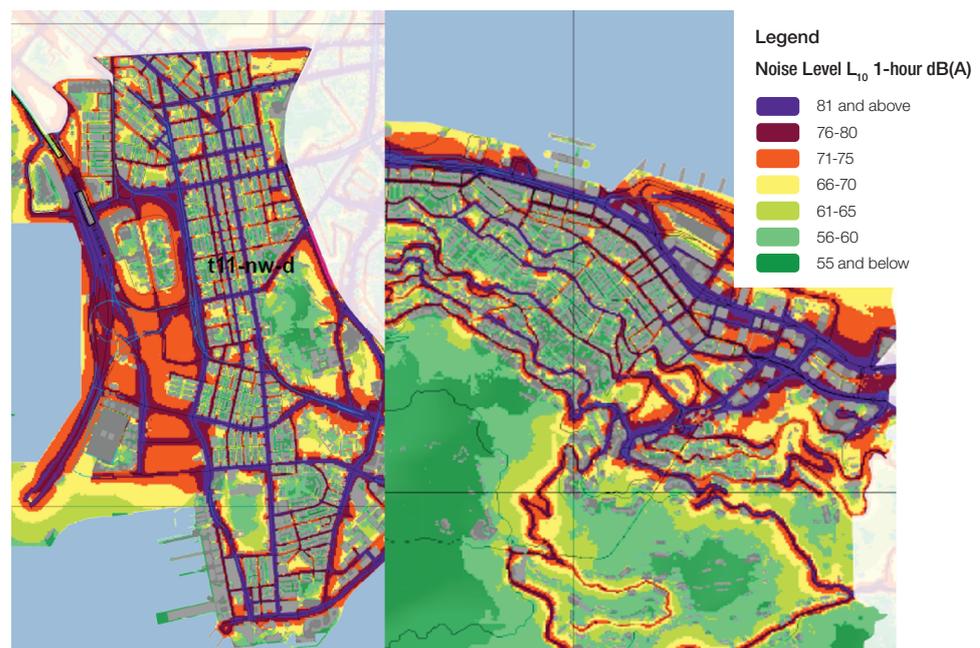
<sup>11</sup> Kao, E. (2018, January 11). Stubborn Roadside Pollutant On Rise Again in Hong Kong After Three Years of Decline, Group Says. South China Morning Post. Retrieved from <http://www.scmp.com/news/hong-kong/health-environment/article/2127863/stubborn-roadside-pollutant-rise-again-hong-kong>.

from the School of Public Health and Primary Care at the Chinese University of Hong Kong have estimated that the air pollutants NO<sup>2</sup> and PM<sub>2.5</sub> account for 6,308 premature deaths, 4,613 hospital admissions for cardiopulmonary diseases, and 44,907 visits to general outpatient clinics every year<sup>12</sup>.

Traffic noise pollution is also a major concern as it affects about 960,000 people<sup>13</sup>. More than 20% of Kowloon City, Wan Chai and Yau Tsim Mong's population is exposed to excessive noise pollution (i.e., over 70dB for at least 10% of an hour), as seen in **Exhibit 9**. Among the sources of noise pollution, road traffic noise is considered the most significant noise problem in Hong Kong. Fixed plant noise and construction noise are controlled under the Noise Control Ordinance, but there is no similar legislation applicable to control road traffic noise.

The high volume of travel on roads is one of the major constraints in tackling the road traffic noise problem in Hong Kong. Our city is full of congested buildings with different types of roads connecting the main centres and forming the major network of the urban areas, linking districts or developments to major roads, and connecting smaller centres of the population with major road networks. The total length of trafficable roads over the whole territory of Hong Kong is 2,104 km and the average daily vehicle-kilometre on roads was as much as 37.41 million in 2016<sup>14</sup>. The proximity of major/local roads to dwellings due to dense development, especially in old districts such as the Yau Tsim Mong District which were developed in the 1970s, also exacerbates an already difficult situation.

#### EXHIBIT 9



NOISE POLLUTION IN URBAN AREAS (KOWLOON AND HONG KONG ISLAND)

Source : Environmental Protection Department

<sup>12</sup> Wong, Tze Wai et al. "Developing an Instrument for Assessing the Health and Economic Impacts of Air Pollution in Hong Kong." (2016, October). Retrieved from [https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/studyreports/files/instrument\\_impacts\\_air\\_pollution.pdf](https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/air/studyreports/files/instrument_impacts_air_pollution.pdf).

<sup>13</sup> Population Exposed to Traffic Noise Department (2010). Environmental Protection Department, The Government of Hong Kong. Retrieved from [https://www.epd.gov.hk/epd/misc/noisemodel1/CDROM\\_L10/images/exposure2010.htm](https://www.epd.gov.hk/epd/misc/noisemodel1/CDROM_L10/images/exposure2010.htm).

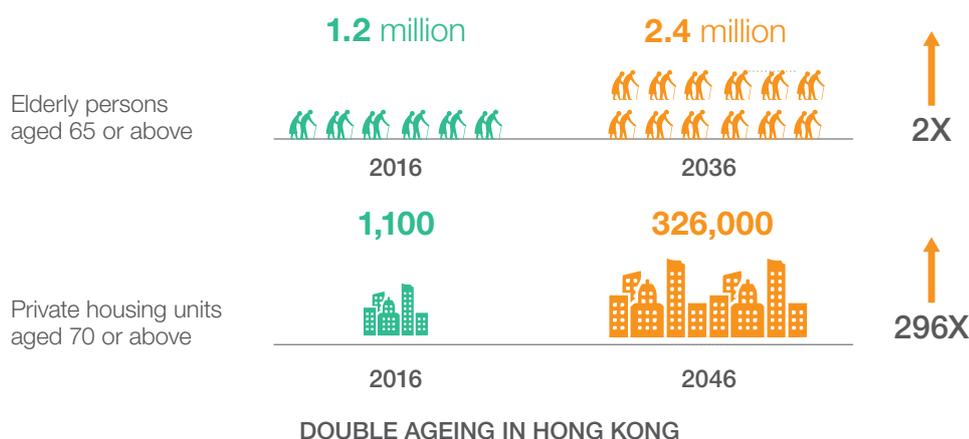
<sup>14</sup> According to the Annual Traffic Census 2016 issued by the Transport Department.

# HONG KONG IN 2046 - WHAT WILL IT LOOK LIKE?

**More must be done to actively transform Hong Kong if it is to remain a competitive city in Asia.** The city is faced with the phenomenon of double ageing, in terms of the population and the infrastructure, as shown in **Exhibit 10**. The elderly population (>65 years), which currently stands at 1.2 million, is expected to double to 2.4 million by 2036<sup>15</sup>. Private housing units are also expected to age rapidly. In 2016, there were only 1,100 private units aged 70 years or above – by 2046, the number will surge almost 300 times to 326,000 units<sup>16</sup>.

Elderly population will double to **2.4 million** in 2036

**EXHIBIT 10**



**DOUBLE AGEING IN HONG KONG**

Source: Census and Statistics Department, Planning Department

## Increasing land supply is a necessary condition for Hong Kong to cope with these emerging challenges – a land shortage will detrimentally impact the long-term development of Hong Kong.

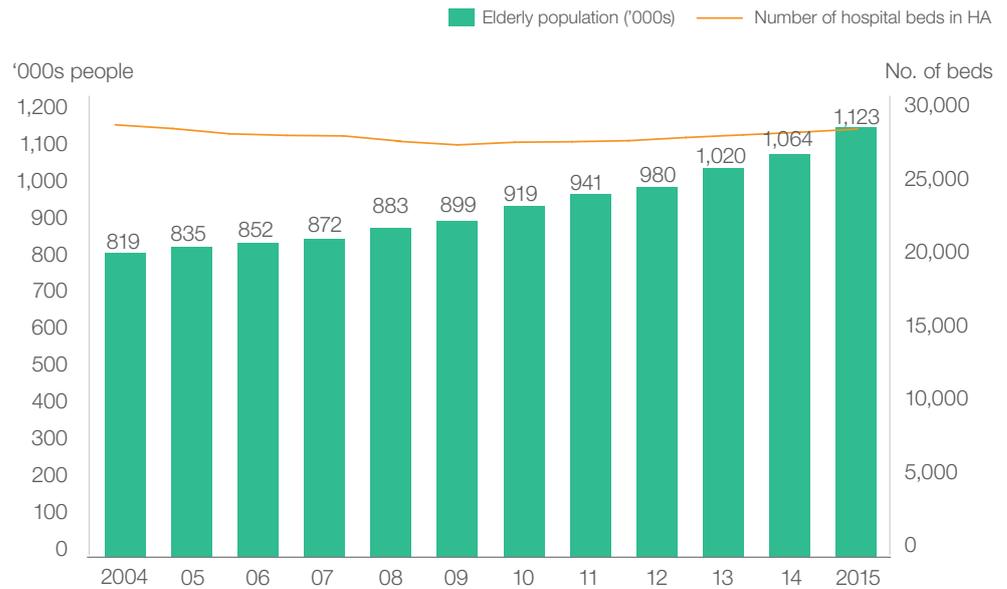
Firstly, an ageing population creates a greater demand for hospital beds, elderly homes and community centres. The number of beds in public hospitals has remained constant for the past 15 years, even though the elderly population has been on the rise (see **Exhibit 11**). As the elderly population continues to grow, hospital bed shortage will only continue to worsen. Furthermore, the government predicts that there will be a shortage of 14,000 beds in elderly homes and centres by 2026<sup>17</sup>. Secondly, redeveloping aged buildings will require decanting land to relocate existing residents. Most of the old private buildings are concentrated in urban areas, e.g., Yau Tsim Mong District, where about 60,000 units will be over 70 years old by 2043. Old buildings not only impact the living conditions of residents, they also pose a threat to lives if they are in a deteriorating structural condition and are not being properly maintained. The Urban Renewal Authority does not have the capacity to redevelop the projected 300,000 aged private housing units with its existing resources. The only way it can handle this onslaught of refurbishing aged buildings is by providing enough land to aid the redevelopment process.

<sup>15</sup> Hong Kong Monthly Digest of Statistics. (2017, October). Censure and Statistics Department, The Government of Hong Kong. Retrieved from <https://www.statistics.gov.hk/pub/B71710FA2017XXXXB0100.pdf>.

<sup>16</sup> Hong Kong 2030+: Towards A Planning Vision and Strategy Transcending 2030 (2016, October). Planning Department, The Government of Hong Kong. Retrieved from [http://www.hk2030plus.hk/document/Consolidated%20Land%20Requirement%20and%20Supply%20Analysis\\_Eng.pdf](http://www.hk2030plus.hk/document/Consolidated%20Land%20Requirement%20and%20Supply%20Analysis_Eng.pdf).

<sup>17</sup> Elderly Services Programme Plan. (2017, June). Working Group on Elderly Services Programme Plan, Elderly Commission, The Government of Hong Kong. Retrieved from [https://www.elderlycommission.gov.hk/en/download/library/ESPP\\_Final\\_Report\\_Eng.pdf](https://www.elderlycommission.gov.hk/en/download/library/ESPP_Final_Report_Eng.pdf)

## EXHIBIT 11



NUMBER OF HOSPITAL BEDS VS. ELDERLY POPULATION

Source: Census and Statistics Department

## IMPERATIVES FOR A NEW SOLUTION

**Finding a solution to Hong Kong's land and liveability issues is imperative.** Do we want our youth to remain pessimistic about the prospects of homeownership? Do we want even more young professionals, who grew up in Hong Kong and love this city, to emigrate simply because Hong Kong has become increasingly unliveable with its growing socioeconomic and environmental issues? As for the many low-income families, do we want them to continue being haunted by a nightmare of ever-rising rents, tiny sub-divided flats, and even longer public housing queues? Their struggles do not stop with housing, but extend to the quality of living as well.

**We believe Hong Kong should embrace a more visionary mindset as a “city of the future”, focus on sustainability, liveability and the well-being of its citizens.** According to a recent report by the McKinsey Global Institute<sup>18</sup>, global citizens today are the least satisfied with traffic congestion and commute times, low connectivity and sense of community, lack of walkability and quality of housing, among many other factors. Meanwhile, futurist city planners have brought forward a human-centric and sustainable blueprint to redefine future cities, which includes:

Hong Kong should embrace a more visionary mindset as a “city of the future”

- Pollution-free air, optimum ambient temperatures and exposure to sunlight through a large network of parks, hanging gardens, green facades, best shadow and wind conditions;
- Optimal green power production, e.g., solar, geothermal and wind;
- Active lifestyle for residents by providing a car-lite lifestyle and walkable streets;
- Limited congestion made possible due to a shift from ownership to usership, optimising mobility over transportation; and
- Flexible and environmentally sustainable forms of mass housing that are tailored to the needs of the community; leveraging prefabrication and modular and additive building techniques to guarantee housing for all.

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<sup>18</sup> Woetzel, J., Remes, J., Boland, B., Lv, K., Sinha, S., Strube, G., et al. (2018, June). Smart Cities: Digital Solutions For A More Livable Future. McKinsey & Company. Retrieved from <https://www.mckinsey.com/~media/mckinsey/industries/capital%20projects%20and%20infrastructure/our%20insights/smart%20cities%20digital%20solutions%20for%20a%20more%20livable%20future/mgi-smart-cities-full-report.ashx>



COMMUNITY  
CENTRE



Chapter 2

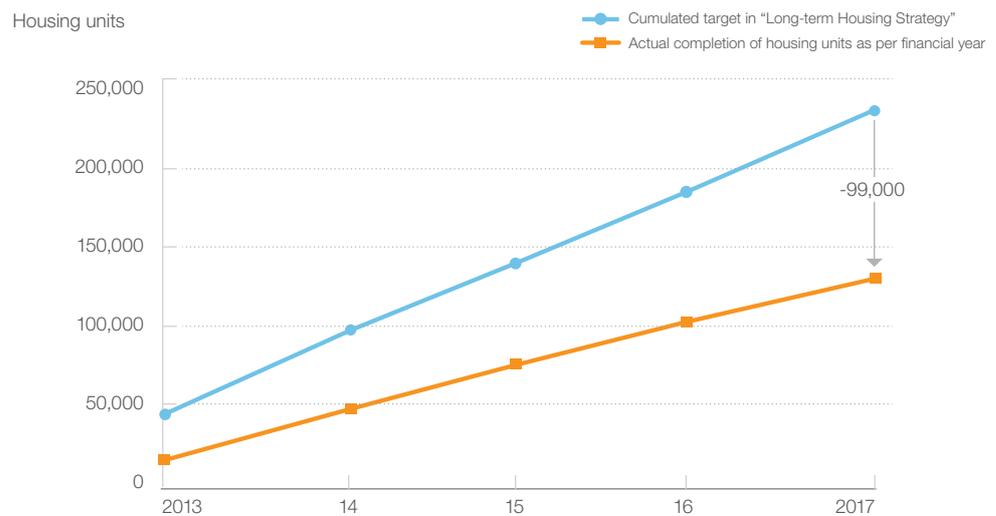
# Dare to Dream - The Game-changer

## ROOT CAUSE OF CAPACITY CONSTRAINTS

We have an accumulated shortfall of **99,000** new housing units in the past 5 years

To achieve our vision to “enhance liveability for all”, land capacity is crucial – sufficient space is necessary if urban planners are to successfully design and execute solutions for housing, community facilities and infrastructure. Yet, our city is already falling short in terms of satisfying basic housing needs, with an accumulated shortfall of 99,000 new housing units from the target stated in the “Long Term Housing Strategy” over the past five years (see **Exhibit 12**). Without the capacity to satisfy basic housing needs, how can we go above and beyond to tackle other liveability concerns?

### EXHIBIT 12



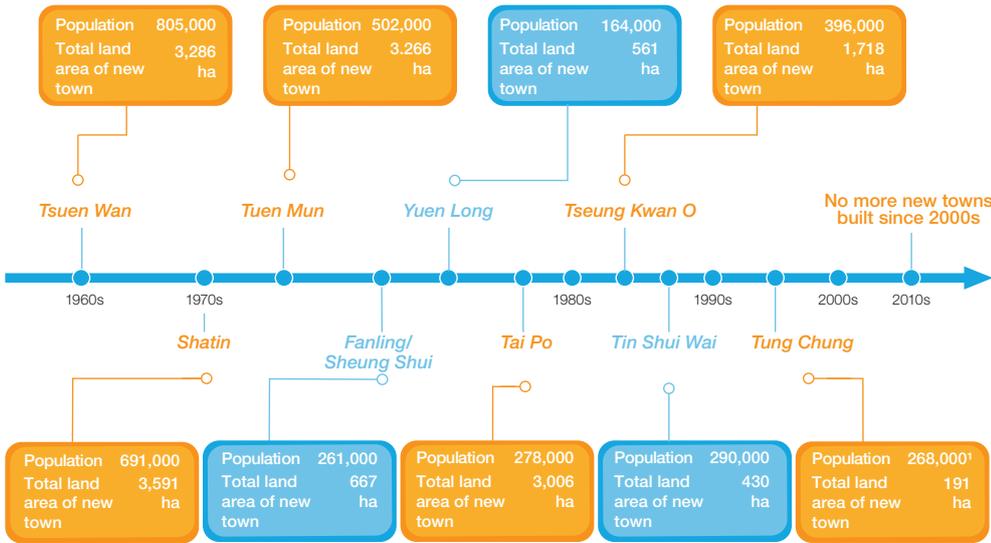
#### ACTUAL COMPLETION STATUS OF “LONG TERM HOUSING STRATEGY” TARGET

Source: Long Term Housing Strategy, Housing Authority, Rating and Valuation Department.

**The fundamental cause of inadequate land capacity is the reduction in land supply available over successive years for the past few decades.** The success of Hong Kong has been highly dependent on the development of new towns through reclamation – with over a quarter of Hong Kong residents now living on reclaimed land. However, with much less land created through reclamation in the past twenty years, the development of new towns has come to a halt (see **Exhibit 13**). Since the completion of Tung Chung new town in the late 90s, there has been no more new town completion. All the while our population has been increasing steadily, land supply has failed to catch up due to the lack of a long-term strategic and holistic plan for our land supply strategy. This has eventually resulted in a huge capacity gap, making it harder to enhance Hong Kong’s liveability.

EXHIBIT 13

Consist of reclaimed land



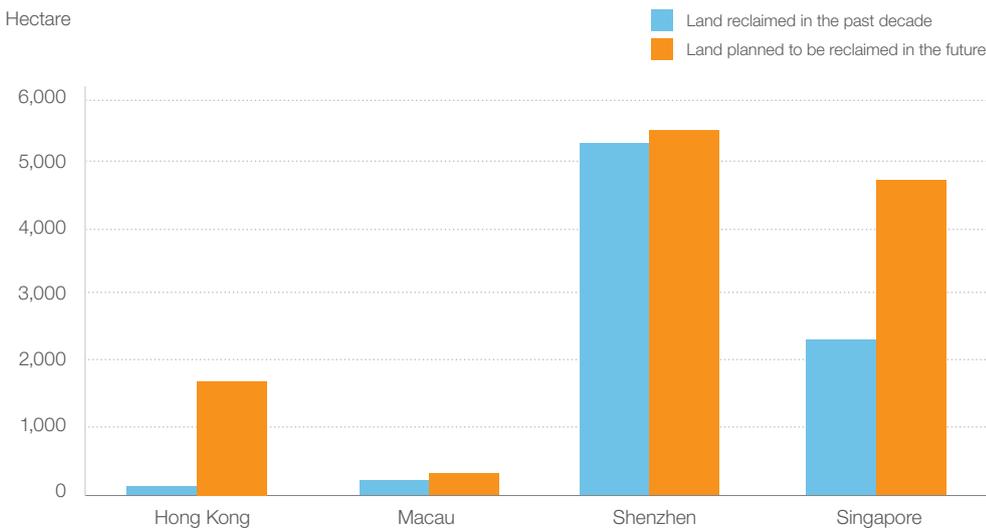
HONG KONG NEW TOWN'S POPULATION AND SIZE

Source: Census & Statistics Department, Civil Engineering and Development Department, Press search

Note: (1) Projected when Phase 4 is completed

By contrast, nearby cities have been actively increasing land supply through reclamation, and will continue to do so in the future, as shown in **Exhibit 14**. With increased land capacity, they will be in a position to build better and more infrastructure to improve their citizens' quality of living, rather than relying on the existing limited land supply to satisfy housing demand. Therefore, we believe, it is the absence of visionary and strategic planning over the past several decades that has come back to haunt us years later and led us to this pass.

EXHIBIT 14



RECLAMATION PROGRESS OF HONG KONG AND NEIGHBORING CITIES

Source: Legislative Council, Singapore Land Authority, Macau Statistics and Census Service, Urban Planning, Land and Resources Commission of Shenzhen

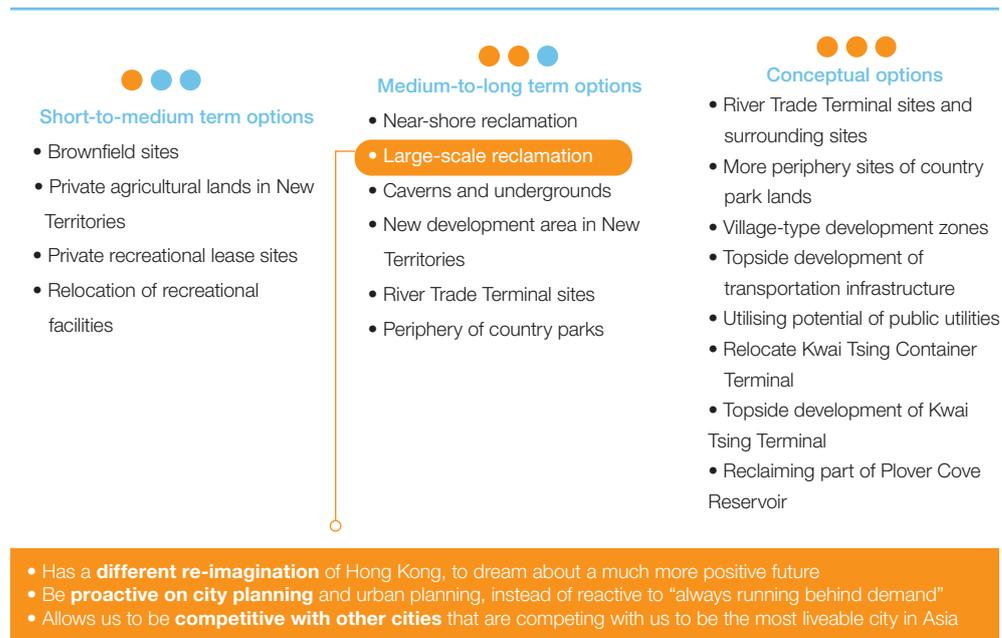
# RECLAMATION AS THE GAME-CHANGER

Only large-scale reclamation can truly provide a new vision for Hong Kong

The government-appointed Task Force on Land Supply has proposed 18 options for consideration in terms of increasing land supply as shown in **Exhibit 15**. However, most of these solutions will not work for Hong Kong. In fact, in our opinion, some of them could even make matters worse. For example, developing brownfield sites (without first sorting out where the existing operators will go) may be detrimental to the survival of some industries. Topside development on existing infrastructures (e.g., transport facilities, Kwai Tsing Container Terminal) will also only further increase the density of existing districts. In other words, these are short-term measures which could potentially worsen the situation, further deteriorating our quality of living.

Out of the 18 proposals from the consultation paper, only large-scale reclamation can truly provide a new vision for Hong Kong. This is the only “game-changer” that will give us the opportunity to re-imagine Hong Kong, to set a new standard for the way we live in the future, and to impart hope to our next generation. No other option provides a new holistic development plan for our society.

## EXHIBIT 15



### 18 OPTIONS FROM THE CONSULTATION DOCUMENT

Source: Task Force on Land Supply

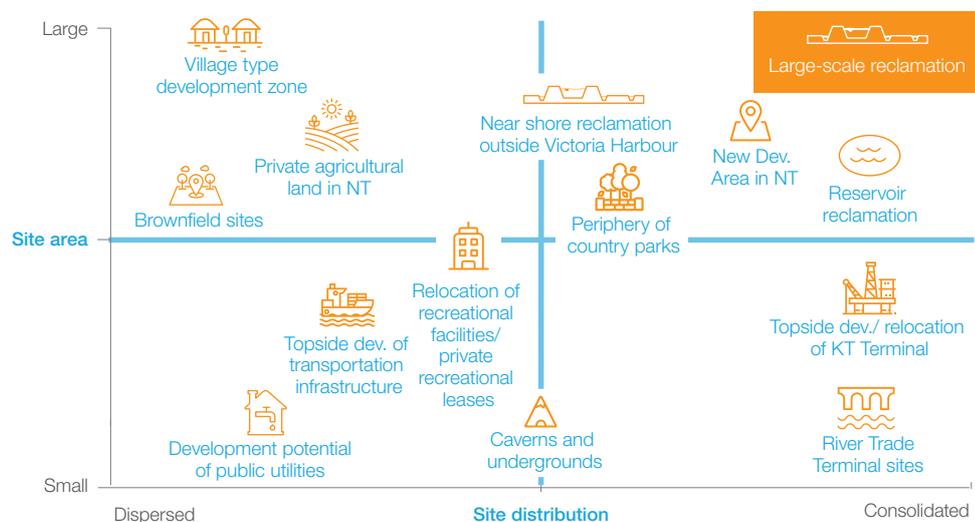
We see three unparalleled advantages in land creation through reclamation:

- **Brand new re-imagining of Hong Kong and the dream of a much more positive future**

In **Exhibit 16**, we have positioned the 18 land supply proposals according to their scale and degree of concentration – these are the two necessary metrics for any successful and visionary urban development. While options like “village type development zone” and “brownfield sites” do provide a large total site area, they are scattered as small patches of land. Some other options are consolidated, but their site areas are comparatively small (e.g.,

River Trade Terminal Site is only 65 hectares) and do not allow us to be visionary and strategic in re-imagining that part of Hong Kong.

## EXHIBIT 16



### LAND SUPPLY OPTION PROVIDED BY THE TASK FORCE ON LAND SUPPLY

Source: Task Force on Land Supply

Note: (1) Some options are combined in the above exhibit. For example, there are two options around River Trade Terminal Site (a medium-to-long term option “developing the River Trade Terminal Site” and a conception option “developing the River Trade Terminal Site and its surroundings in the long term”; they are combined in the above chart for simplicity and better illustration.

(2) This exhibit is for indicative purposes only and is not drawn to scale.

Instead of trying to squeeze the maximum out of every possible piece of existing land, reclamation unlocks several possibilities and allows one to “dream big” and re-imagine the future development of Hong Kong with a large land bank. We will no longer be bound by existing limitations and will be equipped with the capacity to actualise our vision for greater liveability and quality of life. With a large and flat land mass, we can implement forward-looking initiatives and innovations to resolve the current frustrations on a large scale.

- **Be proactive in city planning, instead of reactive to “filling the supply gap”**

We can take charge of planning for our future, instead of adopting a short-sighted approach and providing piecemeal solutions. Large-scale reclamation offers us the capacity to plan ahead for Hong Kong in the next three to five decades, embedding a holistic and integrated planning mindset to the whole project. For example, we would not have engaged in the whole controversy around brownfields had we set aside a designated logistics or industrial zone earlier to accommodate the relevant industries. For a better future, we must craft a better city development plan to anticipate future challenges ahead of time, and land capacity will be a crucial enabler to actualising that vision.

- **Allow us to be competitive with the other cities competing with us to become the most liveable city in Asia**

Large scale reclamation can bring about extended benefits to the entire Hong Kong population and allow us to, at least, be on par if not more attractive than

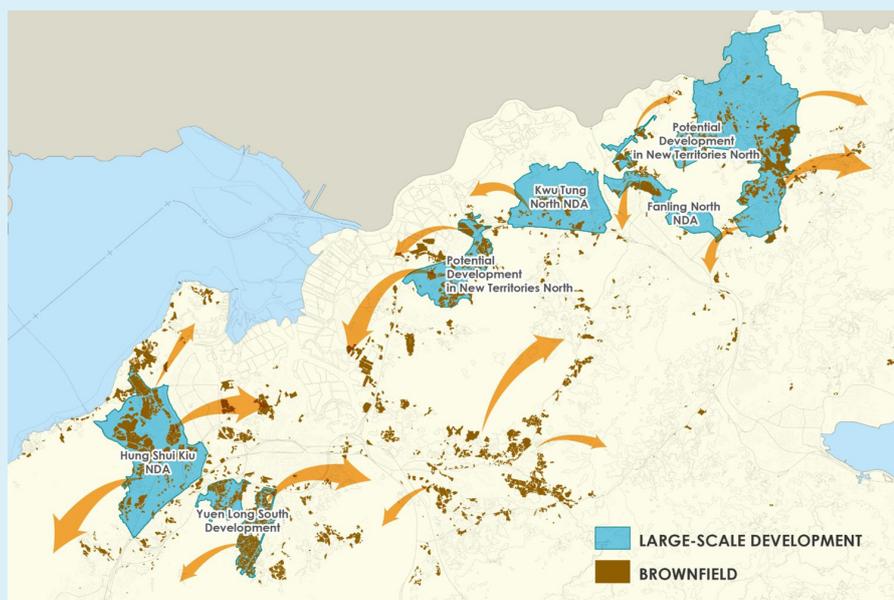
other Asian cities. A significant increase in land capacity could revive our old urban districts to enhance the quality of living for all. We would also be able to revitalise many industries that might otherwise lack the space to thrive. These are all pain points in our city that need to be resolved so that we are able to stay competitive and ahead as the leading city in the Greater Bay Area, if not the whole Asia.

**Of course, it is imperative that we consider other options to solve the most urgent land and housing shortage.** However, it is equally important that we stop being short-sighted and think strategically for Hong Kong in a longer timeframe. Only large-scale reclamation can transform Hong Kong through an integrated urban planning viewpoint in the long run.

Out of the  
**1,300**  
hectares of  
brownfield  
lands, more  
than **40%**  
have already  
been included  
in the current  
government's  
large-scale  
development  
project

## BROWNFIELD - WHAT'S THE REALITY?

There has been heated debate around brownfields in the past few years among the public. Some have claimed that developing brownfields alone could meet Hong Kong's land demand. Yet, we must view the issue through a realistic, rather than an idealistic, lens and evaluate the hurdles we would have to overcome when developing brownfields; and the actual opportunities and benefits they could bring.



To start with, brownfields are currently sparingly scattered across the whole New Territories, as shown in the above map. Nevertheless, out of the ~1,300 hectares of brownfield lands, more than 40% (i.e., 540 hectares) have already been included in the current government's large-scale development projects<sup>19</sup>. Due to their scattered nature and other geographical constraints, whether the remaining sites can be converted into large-scale residential land in a short period of time is questionable.

<sup>19</sup> Brownfield sites included in government's development project includes: (1) Kwu Tung North / Fanling North NDA (50 hectare); (2) Hung Shui Kiu NDA (190 hectare); (3) Yuen Long South Development (100 hectare); (4) Potential development area in NT North (200 hectare). This accounts for around 540 hectares, corresponds to 41.5% of total brownfield sites. Source: "Developing Brownfield Sites". Task Force on Land Supply. [https://landforhongkong.hk/en/supply\\_analysis/brownfield.php#](https://landforhongkong.hk/en/supply_analysis/brownfield.php#).

Furthermore, there are realistic concerns around the necessary supporting infrastructure (e.g., sewage and water system, transportation links) required for large-scale new development area (NDA) projects on the remaining brownfield sites. For sites not included in the NDA plans, there are no systematic, district-wide assessments and planning of supporting infrastructure, which means that substantial time and additional costs will be required to transform these lands before they could potentially be used for residential purposes.

Also, we must not forget that there are existing economic and logistics activities being carried out on these brownfield sites, as shown in the images that follow. If we are to develop these lands, the government must also come up with a comprehensive plan and provide substitute lands and working spaces for the relocation of these businesses. Otherwise, these businesses are highly likely to crawl into new places and convert other vacant land into “new” brownfields.



While we do see the opportunities in brownfields and acknowledge the negative externalities they bring to surrounding neighbourhoods, we also believe that a thorough and complete plan will have to be drawn up in order to fully utilise the potential of the brownfield sites; and admittedly this is not an easy task. Ultimately, if we evaluate the different land supply proposals from the vision we laid out earlier on, which is to increase our citizen's quality of life and the city's overall liveability, brownfields are clearly far from sufficient as game-changers to actualise the vision and lift Hong Kong out of its current predicament.



## OUR PROPOSAL: THE ENHANCED-EAST LANTAU METROPOLIS

Our Hong Kong Foundation (OHKF) has considered multiple large-scale reclamation sites and supported the government's proposal of The East Lantau Metropolis (ELM) as laid out in the "Hong Kong 2030+" paper. Taking into account the concerns most dear to Hong Kong citizens such as ecological value, infrastructural constraints, technical feasibilities, etc., we concluded that the central waters where the proposed ELM is located is the best location for reclamation work<sup>20</sup>.

However, to significantly enhance our liveability, the 1000-hectare plan in "Hong Kong 2030+" is insufficient. Against this backdrop, OHKF has the further vision to leverage the 2030+ ELM proposal, such that the proposed ELM will not only provide land for the strategic growth of Hong Kong beyond 2030, but will also provide a long-term development solution for improving Hong Kong's liveability and enhancing its overall capacity, while taking into account the constraints and opportunities identified in the previous chapter. If we are to move ahead with large-scale reclamation, we must grasp this golden opportunity to re-imagine what a new island could bring to Hong Kong. It is a means to not just alleviating the housing burden, but to achieving the unparalleled advantage of reclamation – proactive urban planning and increased competitiveness – as mentioned earlier.

We propose the Enhanced East Lantau Metropolis, a 2,200-hectare reclaimed island in East Lantau

We propose the Enhanced-East Lantau Metropolis (Enhanced-ELM or EELM) plan, which is a 2,200-hectare reclaimed island in East Lantau, doubling in size of that proposed by the government, as seen in **Exhibit 17**. The concept of the EELM is to create an enlarged land mass significantly more than the original 1,000 ha as proposed under "Hong Kong 2030+". Currently, the EELM is considered to be one single large artificial island between Peng Chau, Kau Yi Chau, Hei Ling Chau and Sunny Island. Subject to more detailed studies in the future, the extent and footprint of the EELM may change.

At this conceptual stage of the EELM Proposal, the outline and footprint of the island boundary have taken into account various technical, environmental and operational considerations such as, hydraulics, marine traffic, marine operations, hydrodynamics, institutional restrictive covenants, environmental ecology, marine mammal ecology, fisheries, conservation areas, and potential hazardous installations. Detailed discussions on these considerations are provided in **Chapter 4** of this report.

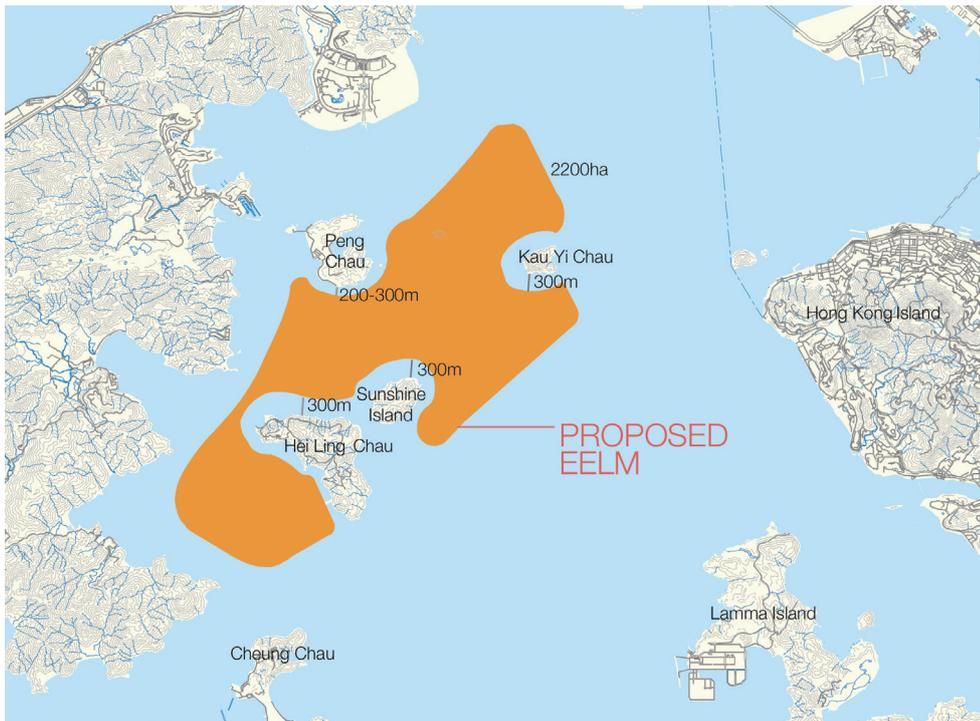
To put the EELM into perspective, it is equivalent to:

- 110 Victoria Parks
- Almost half of the size of Kowloon<sup>21</sup>
- Around 8% of total built-up land in Hong Kong<sup>22</sup>

<sup>20</sup> Other large-scale reclamation sites have also been evaluated including Cheung Chau, Tuen Mun, Lamma Island, Tseung Kwan O and Po Toi Island.

<sup>21</sup> Including the districts of Yau Tsim Mong, Sham Shui Po, Kowloon City, Wong Tai Sin and Kwun Tong. Total Land and Sea Area of Hong Kong. (2018, February 12). Lands Department. Retrieved from <https://www.landsd.gov.hk/mapping/en/publications/total.htm>.

<sup>22</sup> Total built-up land in Hong Kong amounts to 27,000 hectares. Source: "Land Utilization in Hong Kong 2017". Planning Department. Retrieved from [https://www.pland.gov.hk/pland\\_en/info\\_serv/statistic/landu.html](https://www.pland.gov.hk/pland_en/info_serv/statistic/landu.html)



**OUR PROPOSAL: ENHANCED-ELM, A 2,200 HECTARE OF RECLAIMED LAND IN EAST LANTAU**

Source: Arup

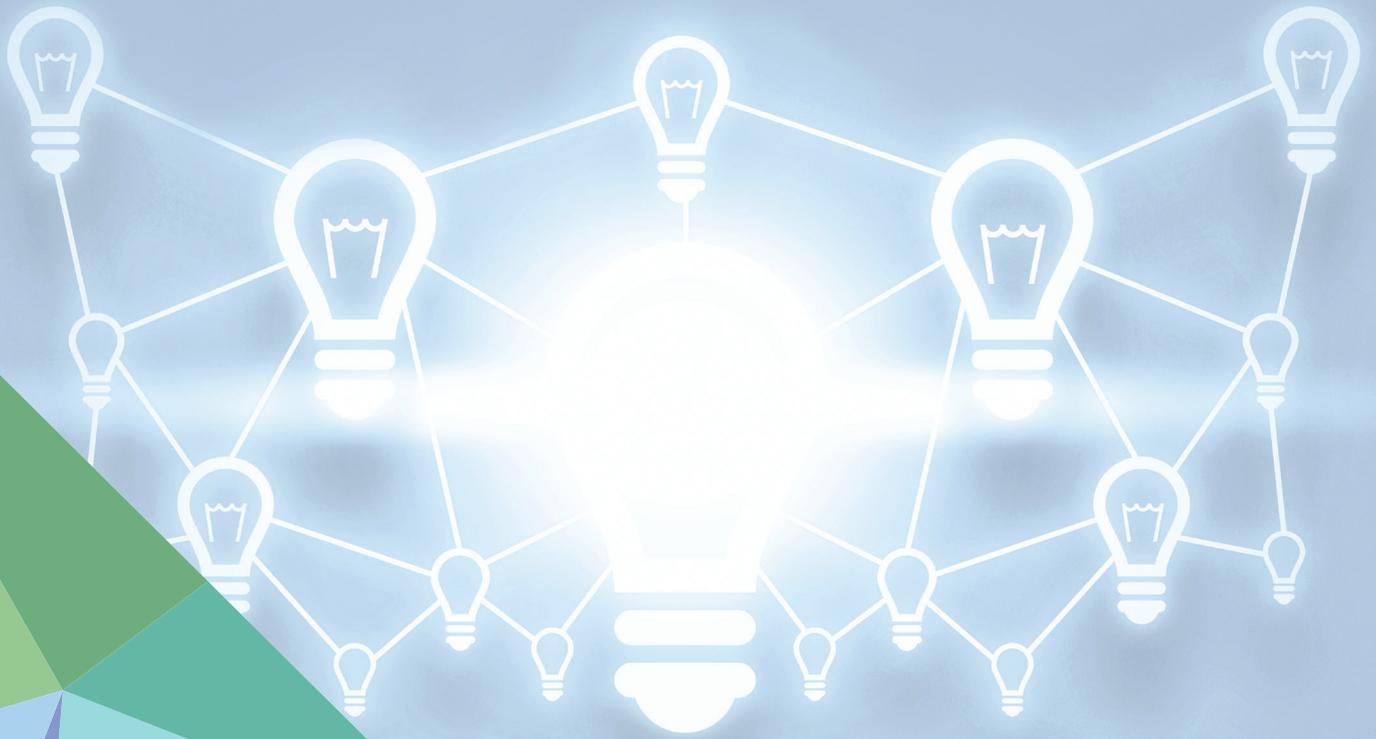
**The island is expected to accommodate 0.7-1.1 million people.** We also envision public housing units to account for the majority of the new residential units, with at least 70% of new residential units provided on EELM. The "Subsidised Homeownership Scheme" (SHS), as advocated in OHKF's previous reports<sup>23</sup> could be adopted for these units. The SHS is a housing strategy focused on multiplying the incidence of homeownership among low-income households. The policy aims to mend the broken housing ladder, allow low-income households to enjoy the capital gain brought about by economic growth, and narrow the economic and social divide due to the inequality of housing. On top of that, we could also re-imagine different possibilities that would help develop and revitalise other industries, something that will be elaborated upon in greater detail in the next chapter.

EELM is expected to accommodate **0.7-1.1 million people**

**The possibilities on this new tract of land are numerous** – it allows us to implement new planning and development initiatives to redefine our living conditions, livelihood and overall quality of life. It also provides us with economic opportunities that we had not envisioned before to develop a range of new industries. In the next chapter, we shall explore the five "re-imaginings" of Hong Kong.

<sup>23</sup> Please refer to our previous report, "Land and Housing Policy Research Series 3: Housing Policy Reform to Narrow Wealth Gap; Urgent Formation of Land to Improve People's Livelihood" for more details. Link: [https://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/ohkf\\_land\\_and\\_housing\\_2017\\_en\\_17102017.pdf](https://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/ohkf_land_and_housing_2017_en_17102017.pdf)





Chapter 3

# Five "Re-imaginings"



## OUR VISION

The EELM shall actualise our long-term vision for Hong Kong as a **people-centric city with enhanced liveability, inclusiveness and sustainability**. The city will no longer be anchored only in its economic growth and development, but it will also emphasise the overall well-being of its citizens and their quality of living.

**The EELM will also be about diversity and the force that helps bridge gaps in society** – there shall be a diversity of land use to satisfy the various emerging needs in society, a diversity of residents of different socio-economic backgrounds, and a diversity of new urban design and ideas to be put forward and piloted on the island. As the urban sociologist, Jane Jacobs, stated in her book “The Death and Life of Great American Cities”, “We need all kinds of diversity, intricately reflected in mutual support. We need this so city life can work decently and constructively, and so the people of cities can sustain (and further develop) their society and civilization”<sup>24</sup>. We believe that the EELM will be a model of what future cities should look like: one that will embrace the heterogeneous nature of our society and build upon Hong Kong’s diverse heritage and culture.

**At a high level, we believe that the EELM can bring about five “re-imaginings” for Hong Kong (Exhibit 18)** – it will become a driving force for Hong Kong to ascend to a new level where we can turn dreams into reality for the benefit of our society. These “re-imaginings” are not just about housing; they are about holistically rethinking the future of Hong Kong while looking through a liveability lens.

- **Re-imagining affordable housing:** Address long-standing housing issues, including long-term land supply, aspirations for homeownership, as well as aspirations about the size of public and private housing.
- **Re-imagining urban design and quality of living:** Set a gold standard of urban city design and planning, showcasing what a “future city” would look like to improve quality of living (e.g., through walkability, at-scale implementation of environmental-friendly solutions, adequate green and communal facilities etc.).
- **Re-imagining the re-development of old Hong Kong:** Provide a large piece of decanting land to facilitate the relocation of residents during the re-development period, which will act as a critical enabler to speed up the process and rethink our approach to urban renewal in dilapidated areas.
- **Re-imagining industry development:** Bring new possibilities to industries that are bottlenecked by shortage of land, as well as accommodate plenty of opportunities for innovation.
- **Re-imagining transportation and connectivity:** Enable strategic transport links between New Territories West, Lantau and Hong Kong Island West, in addition to being at the core of the “one-hour living circle” connection within the Greater Bay Area.

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<sup>24</sup> Jacobs, Jane. (1992) The Death and Life of Great American Cities. New York, NY: Vintage Books.



ENHANCED-ELM: FIVE RE-IMAGINATIONS

Source: Arup

## 1. Re-Imagining Affordable Housing

The scale of increase in developable land gives us the opportunity to **address long-standing housing issues**, including supply of residential land, the chance for homeownership, and provision of new housing types.

**The EELM could potentially enable us to increase our per capita living space.** We envision 28-32% of land in the EELM, the equivalent of 620 – 700 hectares, as being used as residential land. This increase in residential land shall relax the current land constraint and bring Hong Kong’s per capita living space up from the 170 square feet in the status quo to a level closer to that of our neighbouring cities.

**This would also allow us to catch up on past accumulated unmet housing demand**, and to satisfy demand in the years to come. In the past five years, we have fallen short of our target by 99,000 private and public housing units; and in the future, over the next 10 years, we also anticipate missing out on a total of at least 62,600 housing units<sup>25</sup>. With the EELM, we can potentially provide 250,000 to 400,000 new housing units and close the accumulated shortfall.

**We envision the EELM as being a home for all – it could become an inclusive community, accommodating residents from all walks of life and differing socio-economic status.** With this aspiration in mind, we hope that at least 70% of new land on EELM could be allocated to be public housing, adopting the Subsidised Homeownership Scheme (SHS). The SHS is a housing strategy advocated by OHKF, focused on multiplying the incidence of homeownership among low-income households. The policy aims to mend the broken housing ladder, allow low-income households to enjoy the capital gain brought about by economic growth, and narrow the economic and social divide due to the inequality of housing.

We envision  
**28-32%**  
of land in  
the EELM to  
be used as  
residential land

<sup>25</sup> According to the Long Term Housing Strategy, public housing supply targets for the next 10 years is 280,000 units. Based on estimations by OHKF in our previous report, only 217,400 public housing units can be completed. Lacunae in Land Planning: Undersized, Undersupplied and Underestimated (2018). Our Hong Kong Foundation. [https://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/land\\_housing\\_research\\_report\\_engv3.pdf](https://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/land_housing_research_report_engv3.pdf).

**Housing is an issue dear to many people;** it is a critical issue that provokes the greatest dissatisfaction and instils a sense of powerlessness among our citizens. We believe that with the right government policy and proper implementation, the EELM could change the game and actualise the “homeownership dream”.

## 2. Re-imagining Urban Design and Quality of Living

The EELM could also lead the way in transforming Hong Kong into a more liveable city – it can bring the necessary capacity to transform Hong Kong into a less dense and more walkable city with adequate communal facilities. District-wide environmental-friendly solutions can also be rolled out on a large-scale to the island to empower “next-gen” living.

### Quality living for all

With the EELM, the population density<sup>26</sup> in Hong Kong could go down by 12%<sup>27</sup> to about 24,200 people per square kilometre (sq km) (as seen in Exhibit 19).

EXHIBIT 19

Population density in Hong Kong could go down by **12%** with the EELM



### NUMBER OF PERSON PER SQ. KM OF DEVELOPED LAND

Source: Development Bureau, Planning Department, OHKF

Note: (1) Including 3,600 hectares in government’s existing supply projection, 700 hectares in NTN development, and 500 hectares in the five near-shore reclamations.

Assuming that HK’s population will increase to 8.22 million in 2043

(2) Enhanced-ELM will be in the size of 2,200 hectare

Therefore, a decrease in population density in fact translates to higher liveability for all. A less packed environment means less road congestion and better air quality. A lower density also gives us the capacity to redesign our neighbourhoods – we can design wider and more bike-friendly pedestrian pavements to encourage walking, which would in turn reduce traffic accidents while promoting an active and healthy lifestyle among the citizens of Hong Kong.

Land capacity can also be relaxed to build communal facilities to foster a more inclusive and cohesive society. Our current community land per capita

<sup>26</sup> According to the Long Term Housing Strategy, public housing supply targets for the next 10 years is 280,000 units. Based on estimations by OHKF in our previous report, only 217,400 public housing units can be completed.

<sup>27</sup> Number of persons per sq km of developed land can drop from 27,400 in 2017 to 24,200 in 2043 with the Enhanced-ELM.

is the lowest among our neighbours at 7.0 square metres, as shown previously in **Exhibit 3**. Nonetheless, the increased land capacity from the EELM allows us to increase our current community land per capita, which contributes significantly to our quality of living – we can have better opportunities to construct communal facilities like hospitals, community centres, parks and open spaces, etc., which are even more crucial in light of the fact that ours is an ageing population. This fosters a social support network for a more inclusive and cohesive community.

### Case Study: Tengah, Singapore



Photo source: HDB. Retrieved from <http://www20.hdb.gov.sg/fi10/fi10349p.nsf/tengah/index.html>

Tengah is the 24<sup>th</sup> new housing town (HDB town) in Singapore. The 700-hectare town will provide 42,000 new housing units, in which 70% will be public housing<sup>28</sup>. The first batch of 1,500 public housing (HDB) flats will be launched in November 2018, and will be expected to continue to provide a steady stream of Tengah flats<sup>29</sup>.

It is poised to become the biggest “smart and sustainable” town encompassing a “next-gen” city planning mentality to increase the quality of living. Some examples include:

- **Low building density:** Blocks will be built up to 15 storeys in height, with building layouts and orientation optimised to enhance the intensity of wind flow and promote natural ventilation<sup>30</sup>. Low density results in less congestion, improved air quality and reduced noise and air pollution.

<sup>28</sup> Heng, J. (2016, September 9). New Tengah HDB Town Heavy On Greenery, Light On Cars. The Straits Times. Retrieved from <https://www.straitstimes.com/singapore/housing/new-hdb-town-heavy-on-greenery-light-on-cars>.

<sup>29</sup> 'Forest Town' Tengah's First Batch of HDB Flats to be Launched in November (2018 May 13). Channel NewsAsia. Retrieved from <https://www.channelnewsasia.com/news/singapore/forest-town-tengah-s-first-batch-of-hdb-flats-to-be-launched-in-10229232>.

<sup>30</sup> Navaratnarajah, R. (2016, September 13). Smart Technologies Used In Planning Of Tengah. PropertyGuru. Retrieved from <https://www.propertyguru.com.sg/property-management-news/2016/9/135409/smart-technologies-used-in-planning-of-tengah>.

- **Increased walkability:** All roads will feature dedicated walking and cycling paths. The bike-friendly pedestrian pavement could promote an active lifestyle, while boosting a sense of communal unity in the neighbourhood.
- **Car-free town centre:** The town centre will be designed with an underground traffic system, with a 20-hectare central park providing public open spaces.
- **Greenery:** A 100m-wide, 5km-long Forest Corridor will run through the town, with hiking trails for residents to enjoy the greenery.



Photo source: HDB. Retrieved from <http://www20.hdb.gov.sg/fi10/fi10349p.nsf/tengah/index.html>

### Environmental capacity for green urban planning solutions

**The EELM will give us opportunities to re-engineer environmental planning,** the environment being a crucial component of the quality of living. The discourse on the environment has usually painted reclamation in a negative light, highlighting the damage it will bring to the natural ecosystem. Yet, reclamation is also about creating capacity for sustainable environmental development. Innovative concepts can be embedded right from the design phase of the EELM and be tested out on a large-scale, so as to enhance convenience in daily life and improve resource productivity.

**The EELM provides us not just with land capacity, but also an opportunity to implement many next-gen green solutions.** This includes energy, water management, air quality and waste management. As demonstrated by the success of the Harbour Area Treatment Scheme (HATS) Project which significantly reduced the total pollution loading into Victoria Harbour and improved water quality, the EELM could adopt centralised treatment with offshore discharge. In addition, increasing the amount of green coverage and native vegetation in locations such as rooftops, facade walls and vegetated slopes could also enhance the biodiversity in urbanised areas. To promote marine biodiversity, the development of a large marine conservation area that connects with other protected marine areas in the South Lantau waters (i.e., the proposed South Lantau Marine Park and Southwest Lantau Marine Park) could also be considered.

**The EELM can apply the concepts of a smart, green, resilient city,** including a car-free city, with carbon neutrality, circularity of resources and climate resilience.

For example, the coastal shoreline of the EELM would be designed to adapt to future changes in water levels and climatic conditions. The water retention capacity of the EELM would be strengthened by various components such as retention ponds, storm-water wetlands and permeable pavements. These smart green solutions would give us greater capacity to mitigate the environmental risks associated with reclamation.

- **Car-free city:** The EELM's development would require careful and detailed planning in terms of road alignments, layout and orientation of residential building blocks, and other innovative designs such as depressed or underground roads. The transport network would be developed in a vertical profile with a major road traffic network built underground, as seen in **Exhibit 20**. Connectors to destinations from major road traffic hubs could be equipped with personal rapid transport (e.g., Ultra of Heathrow Airport) on rail or electric vehicles. Walkable pedestrian networks and bike-friendly networks would be developed on the car-free surfaces.
- **Carbon neutrality:** Energy consumed in the EELM would be produced by renewable sources as far as is practicable. Other features for achieving net-zero carbon emissions or carbon neutrality include: tri-generation systems which generate electricity, heat and cooling from biogas; waste-to-energy plants; distributed energy systems with smart grid; and responsive facades installed in buildings.
- **Circularity of resources:** The EELM was proposed to have a closed-loop system to recover resources and energy from waste heat and materials. Various energy recovery facilities would be needed to turn biomass and refuse-derived fuel into energy. The EELM would also be equipped with dedicated material recovery facilities for recyclables, and facilities to treat organic food waste.
- **Climate resilience:** The coastal shoreline of the EELM would be designed to adapt to future changes in water levels and climatic conditions. The water retention capacity of the EELM would be strengthened by various components such as retention ponds, storm-water wetlands and permeable pavements.
- **Connectivity:** An integrated urban informatics and services platform would facilitate the management of the EELM by various users including managing authorities, property owners, facility managers and building occupants. By using the platform, residents of the EELM could access mobile applications, automated services and information such as the availability of shared facilities, real-time climatic conditions, pollutants and water levels, traffic conditions, and resource consumption at a building and community level.
- **Eco-shoreline with multifunction uses:** An eco-shoreline has the potential to provide habitats that can enrich or enhance the marine biodiversity and ecological value of an area. The artificial seawall can contain microhabitat features, carrying capacity and ecological interactions in its design. Parts of the shoreline can also be designed and landscaped into areas for amenity leisure uses for the benefit of the community. **Chapter 4** takes an extensive look at the potential of an eco-shoreline.



Examples of such technology include:

- **Smart waste management system:** Connected by an underground system of pipes, Songdo's pneumatic waste disposal system is able to process waste automatically. Household waste is sucked directly from individual kitchens to be automatically sorted and treated – some will be used to produce renewal energy when the system is fully operational<sup>31</sup>.
- **Smart water network:** In addition to water networks for freshwater and sewage per status quo, Songdo also has a water network for treated “grey water” (used for irrigation and toilet flushing), such that water is used in the most efficient way. Buildings internally also recycle a large portion of their own waste water.
- **LEED-certified buildings:** There are 106 buildings and 22 million square feet of LEED (Leadership in Energy and Environmental Design) certification, adhering to the strictest environmental standards with energy-saving features, including sensors and switches.

As a result, Songdo's residents now use 40% less energy per person than an average city<sup>32</sup>, while energy consumption in each building is reduced by 30%<sup>33</sup>.

#### Case study: Jakarta Jaya, Indonesia



Photo source: SHAU. Retrieved from <http://www.shau.nl/en/project/25>

The future Indonesian smart city, Jakarta Jaya, dubbed the “Green Manhattan”, offers greener and more hi-tech urban spaces<sup>34</sup>. The master

<sup>31</sup> Williamson, L. (2013, September 2). Tomorrow's Cities: Just How Smart Is Songdo?. BBC News. Retrieved from <https://www.bbc.com/news/technology-23757738>.

<sup>32</sup> Bishop, A. (2017, January 18). Songdo praised as sustainable new city. Opp Today. Retrieved from <http://www.opp.today/songdo-praised-as-sustainable-new-city/>

<sup>33</sup> South Korea Conceptualizes the Ultimate Smart City (n.d.). NewCities. Retrieved from <https://newcities.org/cityquest-songdo-south-korea-conceptualized-ultimate-smart-sustainable-city/>.

plan's main base is inspired by the Manhattan grid, which provides a sustainable framework for living in a compact yet diverse area. With a timeframe of 30 years, the 5,800-hectare city is expected to provide at least 1.9 million residents new living spaces, public promenades, parks and plazas. Jakarta Jaya's key features include:

- **Self-sustaining ecosystem:** The city aims to have zero net CO2 emissions, 50% of food self-grown and produced, 80% of water self-provided, 150% of green energy produced, and 150% of garbage recycled.
- **Preservation of coastal communities:** The plan provides dedicated zones in strategic parts of the island for small-scale traditional and modern fisheries. There will be specially designed courtyard houses on stilts for optimal airflow and natural lights, and boat moorings next to the dwellings.
- **Increased connectivity and walkability:** The city will be a 90% car-free zone with automated public and private transport. There should be one public white solar car for every 10 inhabitants, 20% of residents using boats to commute, 200m maximum between public transportation stops, and a 1:1 people to bicycle ratio.
- **Empowering the middle and lower class:** 20% of each commercial development will be dedicated to middle- and low- income housing and marketplaces. They will also be able to enjoy public access to plenty of lush tropical parks, beaches, lakes and canals. It will have 50% of green and blue open spaces.

These green initiatives would be hard to implement at a large scale without the EELM – there is already existing infrastructure built in other districts and it would be extremely difficult to revamp it on a district-wide basis. Only with something like the EELM where we can plan the district from scratch, as with Tengah and Songdo, can we implement such “next-gen” holistic urban planning keeping the quality of living in mind.

### **Innovative urban design**

**The EELM could also be a manifestation of the local architects and urban planners who will pioneer design ideas on the island** to create a new face for Hong Kong, one that captures our vision of a people-centric, inclusive and sustainable community. A large piece of land allows many creative ideas to be tested out, which could potentially become the gold standard of urban city design and planning.

**All over the world, cities have leveraged reclaimed land as a pilot ground for creative designs and manifestoes of futuristic vision.** An example is Shenzhen, of which the world renowned architect James Corner has proposed a vibrant plan for a Qianhai Water City<sup>35</sup>. The architect has centred his masterpiece around the theme of water, designing innovative elements to facilitate inhabitants' interaction with water, while emphasising environmental-friendly hydrological infrastructure solutions to save water and resources. Meanwhile, an even more forward-looking

<sup>34</sup> <http://worldlandscapearchitect.com/jakarta-jaya-58-km2-master-plan/#.Wz1a19lzY2w>

<sup>35</sup> Qianhai Water City. Newyork-architects. Retrieved from <https://www.newyork-architects.com/en/james-corner-field-operations-new-york/project/qianhai-water-city>

and aspirational example is Saemangeum in South Korea, which accounts for 28,300 hectares of reclaimed land (i.e., more than 12 times our proposed EELM site). It is expected to become a large greenfield free trade territory to enhance Korea-China economic cooperation. It could become the longest man-made sea barrier in the world, with its strong emphasis on an eco-friendly and sustainable design as the new economic expressway for Korea that could advance beyond Northeast Asia<sup>36</sup>.

### Case Study: Saemangeum, Korea



Photo source: Korea IT Times. Retrieved from <http://www.koreaitimes.com/news/articleView.html?idxno=8174>

Saemangeum is a national project to build a global city as a frontrunner of green growth<sup>37</sup>. It is expected to be completed in 2020, accounting for 28,300 ha of reclaimed land and 11,800 ha of lake infrastructure. The Saemangeum lay at the mouths of the Dongjin and Mangyeong Rivers, on the coast of Jeollabuk-do. Neighbouring districts include Gunsan City, Buan County, and Gimje City. It will become the world's third-largest free trade territory and the area designated as the Korea-China economic cooperation zone<sup>38</sup>.

- **Green and sustainable:** It is designated as the port hinterland for the offshore wind power industry in the Seohaean area, including the largest farming area in Korea and the Yellow Sea. It adopts a resource-circulating agricultural model, which incorporates agro park, a waste pre-processing system, and the reuse of treated waste water, to create an eco-friendly environment<sup>39</sup>.
- **New Renewable Energy Axis:** 15% of total energy will be generated from solar, bio, and wind power. A new renewable energy R&D hub and wind power industry cluster will be built.
- **Special Complex:** Two special zones, including Saemangeum Korea-China Economic Cooperation Complex (SECC) and Saemangeum

<sup>36</sup> Saemangeum: a new global city (2011, November 2). Korea.net. Retrieved from <http://www.korea.net/NewsFocus/policies/view?articleId=89560>

<sup>37</sup> Economic Cooperation Complex. Saemangeum Development and Investment Agency. Retrieved from <http://www.saemangeum.go.kr/sda/en/sub/masterplan/master02/SMB20001.do#none>

<sup>38</sup> Saemangeum Dam - South Korea. Earth Watching. Retrieved from <https://earth.esa.int/web/earth-watching/historical-views/content/-/article/saemangeum-dam-south-korea>

<sup>39</sup> Korea to build carbon-free, green city in Saemangeum. (2011, April 1). eGov innovation. Retrieved from <https://www.enterpriseinnovation.net/article/korea-build-carbon-free-green-city-saemangeum>

Korea-China Industrial Cooperation Complex (SICC), will be jointly developed by Korea and China. The Complex will be a gateway to global markets including Korea and China, who will be able to maximise the synergy by combining the strengths of both countries.

- **Mixed land use:** It is composed of six areas, namely Industry & Research Area, International Cooperation Area, Leisure & Tourism Area, Agriculture & Life Science area, Eco-Environment Area, and Residential Area.
- **Eco-friendly green transportation system:** An express transportation system (airport, seaport, railway, road etc.), 3X3 grid road network, and human-oriented green transportation system (water transportation, public transportation driveway, bicycle road, pedestrian road etc.) were developed to maintain the low carbon green growth.

### Case Study: Qianhai Water City, Shenzhen, China



Photo source: Landscape Australia. Retrieved from <https://landscapeaustralia.com/articles/richard-kennedy-qianhai-water-city/>

The 4,500 acres (~1,800 hectares) of reclaimed land in Qianhai aim to be a key location in the Greater Bay Area, hosting four million people at the western edge of Shenzhen. Therefore, lead architects from James Corner Field Operations have proposed to use landscape as a means to process and remediate the water on site, while simultaneously creating a highly dynamic and watery public realm<sup>40</sup>.

The urban fabric within each development sub-district creates a range of inter-connected urban neighbourhoods. The result is a hyper-dense, ecologically sensitive urban territory with an iconic waterfront, diverse building stock, cultural and recreational features, and unique, inter-connected public open spaces. In the current plan of Qianhai, a lot of these design elements have been retained.

<sup>40</sup> Richard Kennedy: Qianhai Water City. ArchitectreAU. Retrieved from <https://architectureau.com/articles/richard-kennedy-is-interviewed-about-qianhai-water-city/#img=11>

### 3. Re-imagining the Re-development of Old Hong Kong

The EELM provides the means to substantially re-think urban renewal in the dilapidated areas of Hong Kong, relaxing the current land constraints that beset the renewal process. It also helps accelerate relocation of activities from brownfields and refocuses development away from ecologically valuable areas such as country parks.

Today's urban renewal is constrained by many seemingly insurmountable factors:

- **Rising population density**

Re-development projects will almost certainly increase the plot ratio of buildings leading to an even denser population. This is because in order to make the project financially attractive, private property developers will need to increase the plot ratio (i.e., taller buildings, more flats of smaller sizes), given all the costs and effort associated in consolidating ownership. As a profit-making quasi-governmental body, the Urban Renewal Authority is also being subjected to similar financial constraints – on average, gross floor area (GFA) triples after a re-development project<sup>41</sup>, which roughly means three times more people end up living in the same area of land. This leads to the many so-called “toothpick” buildings – scattered, standalone high-risers – popping up among older, low-rise buildings, contributing to over-crowding, traffic congestion, poor air quality, lack of open space, lack of land and space for community use, risk of quick spreading endemic diseases. The combination of transferring development rights for redevelopment at old district and the new development at the proposed EELM would provide a way out for renewal of old districts.

- **Infrastructure overloaded**

Denser populations do not simply imply crowdedness; they also raise real concern about the capacity of existing infrastructure in these districts. Roads are increasingly congested – over the past 15 years, the number of private vehicles grew four times faster than the population<sup>42</sup>. Traffic congestion is already a worry in the older urban areas, such as Yau Tsim Mong, Kowloon City and Sham Shui Po. Given that most aged buildings which require redevelopment are concentrated in the three above areas, increasing plot ratio and packing more people inside these districts will only worsen the situation.

- **Decanting space for relocation is limited**

The 300 times increase in aged building units by 2046 means that significant capacity will be required to relocate existing residents during the redevelopment period (see **Exhibit 10**). As the number of private housing units over 70 years of age will reach 326,000 in 2046, this implies that the same number of vacant “decanting” units are needed during the period. The shortage of decanting land means that we will never be able to catch up on the ageing speed of housing – a pressing situation we cannot ignore.

The number of private housing units over 70 years of age will reach **326,000** in 2046

<sup>41</sup> URA Project Highlights (2009, June 23). Urban Renewal Authority. Retrieved from [http://www.ursreview.gov.hk/eng/doc/20090623\\_panel\\_paper\\_1\\_appendix.pdf](http://www.ursreview.gov.hk/eng/doc/20090623_panel_paper_1_appendix.pdf).

<sup>42</sup> Private vehicles grew at 3% per year while population growth was only 0.8% per year over the period of 1999-2015 (2016, October). Planning Department, The Government of Hong Kong. Retrieved from [http://www.hk2030plus.hk/document/Transport%20Infrastructure%20and%20Traffic%20Review\\_Eng.pdf](http://www.hk2030plus.hk/document/Transport%20Infrastructure%20and%20Traffic%20Review_Eng.pdf).

**Obviously, the current redevelopment model is far from ideal and will require a major revamp.** We need to employ more visionary and forward-looking thinking on this – our mindset must shift from simply “urban redevelopment” to “urban renewal”. We must not be afraid to dream big and imagine how life will improve for those living in the most dilapidated areas, if capacity constraints are lifted and we can fully unlock the potential of urban renewal.

**That is why the land reserve brought by the EELM is going to completely transform our solutions to old urban districts.** Not only can we offer sufficient decanting spaces to relocate residents to and significantly scale up our redevelopment effort, we can also reconstruct the city such that it offers a significantly better quality of living. For example, we are no longer pressurised to rebuild residential buildings as we tear down the old ones – we can think about creating new public open spaces to free up population density; or widening pedestrian pavements to improve safety and walkability; or any other facilities the community demands other than residential buildings. We can imagine a new Central Park like the one in New York City, located in Mong Kok– it seems ambitious, but will certainly not be impossible if land is no longer a scarce resource for Hong Kong.

To summarise, there are a few significant benefits to old urban districts which could be brought by the EELM. They include:

- **Provisioning local GIC and Open Space deficit in built-up urban area**

In addition to meeting housing needs, the "Hong Kong 2030+" plan has identified land supply shortfall for meeting various land uses including housing, economic development, government, institutional and community GI/C, Open Space and transportation facilities. The proposed EELM can provide the needed solution space for meeting those regional shortfalls as well as creating opportunities for provisioning various local (GI/C) and Open Space deficits in already built-up urban areas where space is currently unavailable but could be released by displacing the redevelopment of “old buildings” to the EELM. With the displacement of housing units and by unlocking the urban renewal potential of old districts, Hong Kong’s overall density in urban areas could be improved.

- **Enhancing biodiversity in urbanised areas**

Along with many landscaping and socio-economics benefits, urban forests also serve as ecological linkages with natural habitats in the countryside. In addition, just as landscaping areas in Hong Kong such as gardens can be important homes to species including butterflies, increasing the amount of green cover and native vegetation at possible locations such as rooftops, facade walls and vegetated slopes can enhance biodiversity in the urbanised areas.

- **Improving air quality and noise environment**

Importantly, the development of the EELM aims to relieve the development pressure on existing built areas and provide opportunities for revitalization, e.g., improve air quality and the noise environment, improve the existing air ventilation regime, introduce green and open spaces. All of this together will result in a less dense city that has a greater separation between residential uses and key pollution sources such as major highways and major industrial areas.

**The EELM can also provide solutions for other redevelopment pain-points that our city currently faces, including a long-term solution to eradicating brownfields.** Many argue in support of developing brownfields, i.e., logistics land converted from agricultural land scattered in New Territories. However, there are already existing businesses operating on these sites and serious thought will need to be given to relocating them. Or else we will only be creating even more brownfields when they continue operations in other vacant agricultural lands. The EELM could potentially offer a comprehensive solution to eradicate brownfields – there could be lands on the island dedicated to logistics that these brownfield businesses could move to permanently. In other words, become an enabler to facilitate the development of brownfields as well.

**More importantly, a new set of pilot rules and prototypes could be set up to tear away the red tape of the government, and lead the way to setting a gold standard of efficiency, collaborations, creativity and social capital** for the future cities of the world. At present, rezoning and re-developing existing land is going to take time to complete because of the complicated regulations and applications that will first need to be overcome. The Harvard Professor of Economics Edward Glaeser in fact had this to say on the subject: that the United States faced a nationwide crisis in affordable housing not because of high construction costs or high land values, but because of the high regulation costs imposed by zoning and other land use controls<sup>43</sup>. While it is impossible to imagine how our economic development will evolve in the next thirty years, we must ensure that re-development costs and bureaucratic “red tape” is minimised. The EELM gives us a whole new perspective on how to carry out urban renewal, encouraging discussions and policy revamp to push for higher efficiency.

## 4. Re-imagining Industry Development

The increase in land capacity is for all – it is not just about city planning for better liveability, but could also potentially **bring better development to many industries that are bottlenecked by the shortage of land.** The EELM could play a part in dealing with this land supply shortfall and housing appropriate industries at this location. It has a locational advantage in being the nearest central business district (CBD) to the Hong Kong-Zhuhai-Macau Bridge connection as well as to the Greater Bay Area via Deep Bay Link. By providing land for looking into new possibilities and diversifying Hong Kong’s business and economic environment, it would ingrain resilience into Hong Kong’s economic structure when absorbing financial sector shocks and act as catalyst for its long term sustainable economic development.

**12-21%** of land will be available from the EELM as economic land

Moreover, past administrations have always been ambitious about transforming Hong Kong into an “industrial economy” with new pillar industries by bringing more variety on top of our thriving financial industry. These efforts have become rather futile given the limited capacity to develop – however with 12-21% economic land available from the EELM, i.e., equivalent to 260-460 hectares, we are making sure that Hong Kong continues to be relevant and competitive in the long term.

**We will delve into a few selected sectors to showcase how land capacity is crucial for re-imagining “out of the box”** future development potential. These are just some examples for us to ponder over –to say that the EELM should be used to support the following developments is not a definitive statement but rather a thought starter that serves to get us thinking about the possibilities when land is no longer a constraint. Of course, complementary policies are important for maximising the EELM’s economic potential; but land capacity is equally crucial as a necessary enabler to develop these industries and allow Hong Kong to remain one of the most competitive cities in Asia.

<sup>43</sup> Wong, Y. C. (2014, June). The High Regulation Cost of Development: What Thomas Piketty’s Famous Book Really Says. Y C Richard Wong on the Political Economy of HK and China. Retrieved from <http://wangyujian.hku.hk/?p=4409&lang=en>

## Education

The government has long stated its aspirations to “fortify our status” and “**enhance Hong Kong’s position as a regional education hub**”<sup>44</sup>. To make this come true, we must scale up to become a destination for education for foreign students, have a concentration of eminent education institutes that are respected around the world, and an international centre for training and research which draws top global faculty and talent. However, the reality is that the land shortage for research space, dormitories and teaching facilities has become a significant roadblock to actualise our vision of being such an education hub.

**The land on EELM will help fulfil this aspiration.** With adequate supporting policies and appropriate incentives, we could potentially:

- **Attract top international institutions to set up their Asia branch in Hong Kong**

Countries like the UAE and Singapore have been actively attracting top global universities to set up regional branches to strengthen their “education hub” value proposition and lure international students. Examples like INSEAD in Singapore and NYU Abu Dhabi have not only brought in talent for the city, but also encouraged cross-cultural interaction among students. Unfortunately, Hong Kong has sacrificed its city’s educational competitiveness due to land shortage, and the government has backed away from plans to invite international institutions onto the Queen’s Hill site in exchange for more public housing sites<sup>45</sup>. With the EELM, we could have additional land reserves that will help attract top-notch institutions, which could in turn increase the competitiveness of graduates in the city.

- **Build world-class research laboratories**

Lifting land constraints can also boost Hong Kong’s attractiveness with top academia in terms of relocating to a city with sufficient resources and capacity to conduct their research. There have been cases where international experts refused to conduct clinical research in Hong Kong due to limited research capacity<sup>46</sup> – this directly hampered both the quality of faculty being brought in and our academic and research capabilities, two factors that would be important indicators of our competitiveness as a regional education hub.

- **More dormitories and teaching facilities to attract foreign students in Hong Kong**

The key of a regional education hub is the internationalization of both its teaching staff and students – however currently the lack of supporting infrastructure is discouraging foreign students and incoming exchange students from coming to Hong Kong. There is a projected shortfall of 13,600 university dormitories for the academic year 2018/19<sup>47</sup> – we need land capacity to significantly ramp up the necessary infrastructure, including dormitories, research laboratories, and teaching facilities to attract foreign students.

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<sup>44</sup> Lam, C (2017). The Chief Executive’s 2017 Policy Address. The Government of Hong Kong. Retrieved from [https://www.policyaddress.gov.hk/2017/eng/policy\\_ch04.html](https://www.policyaddress.gov.hk/2017/eng/policy_ch04.html).

<sup>45</sup> 皇后山棄私大建公屋. 提供逾萬單位. 交通配套難應付 (2013, December 23). Apple Daily. Retrieved from <https://hk.news.appledaily.com/local/daily/article/20131223/18562710>.

<sup>46</sup> 公院鬧醫生荒. 中大醫學院長: 加醫科生不是多個人多雙筷 (2018, April 3). Topick. Retrieved from <https://topick.hket.com/>

<sup>47</sup> Hostel Development Fund for the University Grants Committee-funded Sector. (2017, December 1). Legislative Council of Hong Kong. Retrieved from <https://www.legco.gov.hk/yr17-18/english/panels/ed/papers/ed20171201cb4-287-1-e.pdf>

## Case Study: Education – Dubai International Academic City



Photo source: DAR. Retrieved from <http://www.dar.ae/?timeline=academic-city>

The Dubai International Academic City (DIAC) was launched in 2007 and was built from scratch on an area of around 1,200 hectares. With this large piece of land, DIAC was able to draw over 27 universities from nine countries and host over 25,000 students in more than 450 degree programmes. As of 2010, it became host to over half of the universities in the UAE and around a quarter of universities in the GCC. It has a vision to offer innovative academic choices for the region – “By offering leading education infrastructure to our academic partners, we aim to contribute to the advancement of the human capital of the UAE and the region through the development of quality graduates,” as noted by Dr Ayoub Kazim, Executive Director of DIAC<sup>48</sup>.

We welcome and appreciate the current administration’s efforts to strengthen Hong Kong as an education hub by, for instance, substantially injecting investment into the Research Endowment Fund and the Hostel Development Fund. Nevertheless, **the inherent constraints over land will increasingly act as a bigger and bigger hindrance as other cities leverage their land advantage and step up their respective games.** Other than DIAC in Dubai, Shenzhen has also built the 150-hectare University Town of Shenzhen, attracting top-notch Chinese universities such as Tsinghua University and Harbin Institute of Technology to set up branches in the campus. There is no time to ponder and wait – similar to land strategy, we must be proactive in sharpening our edge in the education sector, instead of reactively responding to challenges.

### Creative Industry

**Hong Kong has lost the glory of her heyday when she was considered a powerhouse of the Asian film industry in the last century.** In the early 90’s, Hong Kong released more than 200 local films a year, but that number has dropped to

<sup>48</sup> UNESCO University Report Lauds DIAC (2010, January 6). TradeArabia. Retrieved from [http://www.tradearabia.com/news/EDU\\_172807.html](http://www.tradearabia.com/news/EDU_172807.html). insight/70/%E4%B8%AD%E8%8F%AF%E5%AD%B8%E7%A4%BE/%E6%B7%B1%E5%9C%B3%E5%B0%87%E5%BB%BA%E5%85%A8%E7%90%83%E6%9C%80%E5%A4%A7%E6%9C%83%E5%B1%95%E4%B8%AD%E5%BF%83

around 60 today<sup>49</sup>. There are many great talents who remain devoted to the Hong Kong film industry, but we must also ensure that we put in place the supporting infrastructure and policies that will help us catch up.

**For example, since the closure of Shaw Studios, Hong Kong no longer has an iconic landmark representing our status as the “Hollywood of the East”.** Shaw Studios was once the largest private film studio in the world, occupying 186,000 square metres. However, it is scheduled to be closed in 2023 in order to give way to residential and commercial use. The seven studios we have now in Hong Kong are no longer competitive in view of the large-scale studios in the Greater Bay Area, among which Foshan’s “CCTV Nanhai Movie & TV Town” occupies a vast area of 1 million square metres. Other cities have already overtaken us – a case in point is the Qingdao Wanda Movie Metropolis (see case study below), which is planned to attract 30 foreign films and over 100 Chinese films to produce on the site. We no longer have the upper hand due to land shortage. If we do not actively turn the situation around, our once glorious days of movie production may forever be behind us.

### Case Study: Creative – Qingdao Wanda Movie Metropolis



Photo source: blooloop. Retrieved from <https://blooloop.com/news/dalian-wanda-qingdao-movie-metropolis/>

The Qingdao Wanda Movie Metropolis is a major Chinese studio, spread across 376 hectares<sup>50</sup>, equivalent to three CUHK campuses. The film complex combines a 166-hectare film and television production studio, shopping malls, resort hotels, etc., and is the largest entertainment infrastructure project ever attempted. Wanda has already signed contracts with global entertainment producers, with an estimate of having over 30 foreign movies filmed here.

<sup>49</sup> Chan, C.W. (2000). *The Structure and Marketing Analysis of Hong Kong Film Industry*. City Entertainment, Hong Kong.

<sup>50</sup> Wanda Hopes \$8 Billion Film Complex Will Bring Industry Stardom (2018, April 28). Bloomberg. Retrieved from <https://www.bloomberg.com/news/articles/2018-04-28/wanda-hopes-8-billion-film-complex-will-bring-industry-stardom>.

**Fortunately, the EELM gives us the capacity to energise our movie industry and become competitive again.** Once this occurs, we could think very differently about the development of a creative industry with the possibilities of executing bold and ambitious ideas. For the film industry, we could think about building a new movie studio competitive with the neighbouring cities, leveraging our expertise in film production. We could also think about enhancing our position as the film deal-making marketplace, learning from Hollywood's model. FILMART<sup>51</sup>, a film deal marketplace taking place in Hong Kong, hosts exhibitors from over 35 countries as the largest Asian marketplace.

**Other creative industries can also revitalise this city which is now dubbed as a “cultural desert”.** Once the land constraint is lifted, for example, we can build art districts with affordable studios for aspiring artists and creative talents, similar to Beijing 798 Art Zone and resembling a larger form of the local Cattle Depot Artist Village in To Kwa Wan. There could be a street-performing zone for cultural activities, supplementing the West Kowloon Cultural District. We could develop an art district showcasing the work of local artists – a platform for them to gain exposure. Art studios at affordable rents could also be built – artists will not leave Hong Kong to look for a better base.

**The EELM opens up all kinds of possibilities for Hong Kong in terms of activating its potential to become Asia's talent hub** for design, art and cinematic production. The youth can have more variety in their career paths. Artists and creative talents can envision showcasing their talents.

## MICE

**MICE** (“meetings, incentives, conferencing and exhibitions”) **has been one of Hong Kong's flagship industries, contributing over 2% of GDP (i.e., HK\$52.9 billion) for the city in 2016**<sup>52</sup>. In the same year, Hong Kong has hosted more than 100 exhibitions, with over 1.8 million overseas overnight MICE visitors. However, MICE suffers from the consequences of land shortage as well – Hong Kong Trade Development Council estimated that there will be a peak-period shortfall of about 130,000 square metres of convention and exhibition space by 2028<sup>53</sup>. In search of new space, the government has even considered demolishing Wan Chai Stadium for Hong Kong Convention and Exhibition Centre's Phase III expansion plan<sup>54</sup>.

**The fact that our reputation as the leading MICE destination is in danger due to venue shortage cannot be refuted.** We were crowned as “Asia's Leading Meetings & Conference Destination” in 2015 and 2016 – yet we have already lost the title to Shanghai in 2017<sup>55</sup>. Even more alarming will be the launch of the brand new “Shenzhen International Convention and Exhibition Centre”, just a river apart – as covered by OHKF before<sup>56</sup>, it is expected to be the world's largest exhibition centre (see case study below). The inconvenient truth is that with this lack of land capacity, we will not have the ability to defend our position among our peers.

<sup>51</sup> Chu, K. (2018, March 22). Filmart 2018 Sees Record Visitor and Exhibitor Numbers. The Hollywood Reporter. Retrieved from <https://www.hollywoodreporter.com/news/filmart-years-market-was-bigger-better-busier-1096511>.

<sup>52</sup> Study Reveals Hong Kong's Exhibition Industry Contributes HK\$52.9 Billion In 2016 International Exhibitors' Average Spend 75% More Than General Overnight Tourists (n.d.) The Hong Kong Exhibition & Convention Industry Association. Retrieved from <https://www.exhibitions.org.hk/en/media-centre/156-eis-2016>.

<sup>53</sup> Convention and Exhibition Industry in Hong Kong (2017, June 16). Hong Kong Trade Development Council. Retrieved from <http://hong-kong-economy-research.hktdc.com/business-news/article/Hong-Kong-Industry-Profiles/Convention-and-Exhibition-Industry-in-Hong-Kong/hkip/en/1/1X-000000/1X0018NP.htm>.

<sup>54</sup> Sports Ground Revamp Beneficial (2017, January 19). Hong Kong's Information Services Department. Retrieved from [http://www.news.gov.hk/en/categories/finance/html/2017/01/20170119\\_142438.shtml](http://www.news.gov.hk/en/categories/finance/html/2017/01/20170119_142438.shtml).

<sup>55</sup> Asia's Leading Meetings & Conference Destination 2017 (n.d.). World Travel Awards. Retrieved from <https://www.worldtravelawards.com/award-asias-leading-meetings-and-conference-destination-2017>.

<sup>56</sup> 深圳將建全球最大會展中心 (2015, June 22). Our Hong Kong Foundation.

## Case Study: MICE – Shenzhen International Convention and Exhibition Center (SZIEC)



Photo source: South China University of Technology. Retrieved from <http://wind.sklsbs.com/article.aspx?id=277>

The SZIEC project, which is projected to complete its first phase by September 2018, will encompass a total of 148 hectares. The exhibition centre will provide exhibit space of 50 hectares in terms of total floor area, taking over Hannover Messe as the world's largest exhibition centre. By comparison, Chicago McCormick Place, the largest convention centre in the US, has around 24 hectares of exhibit space. Both vastly exceed Hong Kong, which only has a total of 15 hectares of exhibit space. It is not hard to imagine that once SZIEC is built, events and exhibition will gradually move towards the newer, bigger and grander venue in a city just next to Hong Kong.

**The EELM will relax land constraints such that we will have the capacity to build a new state-of-the-art conference and exhibition centre.** To complement HKCEC and AsiaWorld Expo (AWE), a new venue, potentially located on the EELM and leveraging its strategic location, will enable us to maintain our position as the premier leading MICE destination. For example, we will then have the capacity to bid for prestigious international conventions, summits, and conferences held by intergovernmental organisations, such as the United Nations or WHO, enticing talent to gather in the city. It can also become an engine to drive employment opportunities across various hospitality sectors. AWE was estimated to have brought over 40,000 supporting jobs to Hong Kong<sup>57</sup> – a new exhibition centre could add to that and further strengthen MICE's contribution to our economy.

**An exhibition venue enabled by the EELM will sustain our competitive advantage in the region, especially in the face of the fierce challenges from our neighbouring cities.** The global MICE industry's value is projected to reach over US\$1.2 trillion in 2023, and Asia-Pacific is expected to witness the highest growth rate of 8.6% during the forecast period<sup>58</sup>. These opportunities have always belonged to Hong Kong, and we shall seize the chance to continue capturing them in the upcoming boom.

**Other than education and the creative and MICE industries, relaxing land constraints will also help to boost development in many other industries, such as healthcare, entrepreneurship / technology and sports.**

<sup>57</sup> Executive Summary: Economic Impacts (n.d.). KPMG. Retrieved from <https://www.asiaworld-expo.com/assets/doc/KPMG-AWE-5a953e5b7f.pdf>.

<sup>58</sup> MICE Industry Expected to Reach \$1,245 Billion, Globally, By 2023 (n.d.). Allied Market Research. Retrieved from <https://www.alliedmarketresearch.com/press-release/MICE-industry-market.html>.

## Healthcare

The idea of primary care has been around for decades but there has been a general difficulty in implementing it in Hong Kong, given the lack of spaces in existing urban districts. Developing a strong primary care network is important as it could also help alleviate the burden of public hospitals in Hong Kong. Our current Chief Executive has also mentioned in her 2017 Policy Address that a steering committee on the said topic will be set up<sup>59</sup>. As our society is facing the issue of an ageing population, there is an urgent need to develop primary care with a shift of focus towards a more community-oriented approach.

We hope that by improving our capacity on land, Hong Kong could become a centre of health excellence with an orientation towards primary care in terms of service delivery. Additional capacity could also be provided in training in geriatrics, palliative care and end-of-life care such that the needs of an ageing population could be catered to. Eventually the provision of primary care could move towards an integrated care approach. This would be particularly relevant in old urban districts where there is a larger aged community. During the urban redevelopment process, there may be opportunities in setting up additional community healthcare and elderly centres, catering for the needs of the aged in the community.

## Entrepreneurship / Technology

The Hong Kong government has stated that it is determined to boost the development of emerging industries in addition to our traditional industries, and considers that innovation and technology industries have a competitive edge and much potential<sup>60</sup>. However, lack of land supply has become one of our greatest limitations in fulfilling our potential.

To illustrate, in 2013, Google announced its decision to withdraw a plan to build a regional data centre hub in Hong Kong. The decision was made despite that fact that the Hong Kong Science and Technology Parks Corporation had already granted a site of 2.7 hectares to Google for the plan. Google explained that the lack of land availability would not be favourable for its long-term strategic development, as they might not be able to achieve economies of scale<sup>61</sup>. It turned to Singapore instead for its regional headquarters<sup>62</sup> and data centre clusters. It has since made significant investment totalling US\$500 million into its Singapore's operations, with expansion plans to build a second data centre to keep up with Asia's growing web and mobile adoption<sup>63</sup>.

The above example suggests that in order for Hong Kong to stay relevant in the global tech players' expansion plan, we should offer a comprehensive and competitive package that will incentivise them into establishing a presence in our city. A sufficient capacity of land could help us cater to their physical needs of setting up an office, research and development lab and/ or data centre.

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<sup>59</sup> Part V. Improving People's Livelihood. The Chief Executive's 2017 Policy Address. Retrieved from [https://www.policyaddress.gov.hk/2017/eng/policy\\_ch05.html](https://www.policyaddress.gov.hk/2017/eng/policy_ch05.html)

<sup>60</sup> Speech. The Chief Executive's 2017 Policy Address. Retrieved from <https://www.policyaddress.gov.hk/2017/eng/speech.html>

<sup>61</sup> Lau, S., Nip, A. (2013, December 11). Google abandons its Hong Kong data centre project. South China Morning Post. Retrieved from <https://www.scmp.com/news/hong-kong/article/1377908/google-abandons-its-hong-kong-data-centre-project>

<sup>62</sup> See Kit, Tang (2016, November 10). Google moves to new office in Singapore to house growing team. Channel NewsAsia. Retrieved from <https://www.channelnewsasia.com/news/singapore/google-moves-to-new-office-in-singapore-to-house-growing-team-7686728>

<sup>63</sup> Yu, E. (2015, June 2). Google pumps \$380M into second Singapore data center. ZD Net. Retrieved from <https://www.zdnet.com/article/google-pumps-380m-to-build-second-singapore-data-center/>

This would help foster a vibrant ecosystem for the industry. In addition, with the newly created capacity of land, we could also provide space to help incubate local start-ups and entrepreneurs, which is an area our city needs to catch up on.

## Sports

Sports development is crucial in building a healthy and active society, while support towards local athletes in Hong Kong also helps cultivate a strong sense of belonging to the city and establishes a more diversified career path for the young generation in society. Similar to the other industries mentioned, for the sports industry, the dual mission of promoting an active lifestyle among the public and creating a “home ground” for top athletes to train and compete in unavoidably also requires sufficient land capacity.

Currently Hong Kong lacks sufficient space for sports facilities. If we could solve this constraint, new sport facilities such as swimming pools and badminton courts could be established for the public’s use. Sports venues operated by Leisure and Cultural Services Department (LCSD) are experiencing almost full utilization at the moment, indicating that their capacity is being challenged. To cite a member of the Legislative Council, it was recently revealed that some of the sports grounds in Hong Kong recorded a utilization rate of 99% but over 80% citizens interviewed found it hard to book LCSD venues<sup>64</sup>. Additionally, a survey done by the Democratic Alliance for the Betterment and Progress of Hong Kong (DAB) in 2017 showed that 55% of the survey respondents believed that there are not enough sports facilities provided by the government<sup>65</sup>.

As for local professional athletes in Hong Kong, additional specialised sports facilities could be established if we had additional land. This may be especially relevant for underexplored Olympic sports that are under-resourced at the moment, such as canoeing, shooting, surfing, indoor winter sports, etc. Apart from helping to bring some diversity to our sports scene, more land for the sports industry would also enable us to tap into our city’s potential in world class games such as the Olympics.

Apart from sports facilities provision for the general public and for professional athletes, with more land for the sports industry, there may also be scope for Hong Kong to develop top-notch grounds for hosting international sports events such as the Asian Games. Our citizens could participate and get involved in the sports community in many such ways. These three aspects could all be constructive in helping us build a community that advocates for a more active lifestyle.

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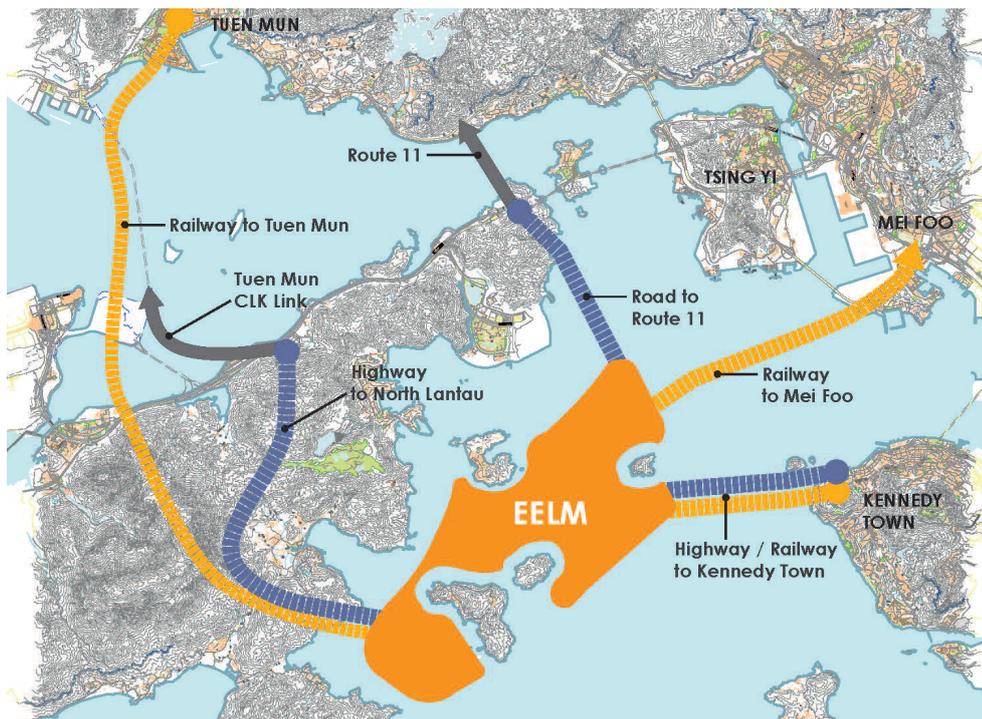
<sup>64</sup> HKET reporter (2018, June 21). 馬逢國斥本港康體場地落後不足 促善用空置校舍及工廈。HKET. Retrieved from <https://topick.hket.com/article/2099095/%E9%A6%AC%E9%80%A2%E5%9C%8B%E6%96%A5%E6%9C%AC%E6%B8%AF%E5%BA%B7%E9%AB%94%E5%A0%B4%E5%9C%B0%E8%90%BD%E5%BE%8C%E4%B8%8D%E8%B6%B3%E3%80%80%E4%B-F%83%E5%96%84%E7%94%A8%E7%A9%BA%E7%BD%AE%E6%A0%A1%E8%88%8D%E5%8F%8A%E5%B7%A5%E5%BB%88>

<sup>65</sup> 文森. (2017, August 17). 近三成市民完全無運動習慣. Wenweipo. Retrieved from <http://paper.wenweipo.com/2017/08/17/YO1708170011.htm>

## 5. Re-imagining Transportation and Connectivity

The EELM can bring new transportation links to enhance connectivity and relieve congestion in the whole city. Again, the EELM will not just benefit the residents living there – what’s so unique about this game-changer is its capability to relieve the frustrations of the Hong Kong people living in other areas as well. New roads and railway links on this island will allow us to re-imagine the transportation network for the entire Hong Kong population, and even those commuting from beyond the city.

### EXHIBIT 21



SUGGESTED NEW ROAD AND RAILWAY LINKS IN EELM

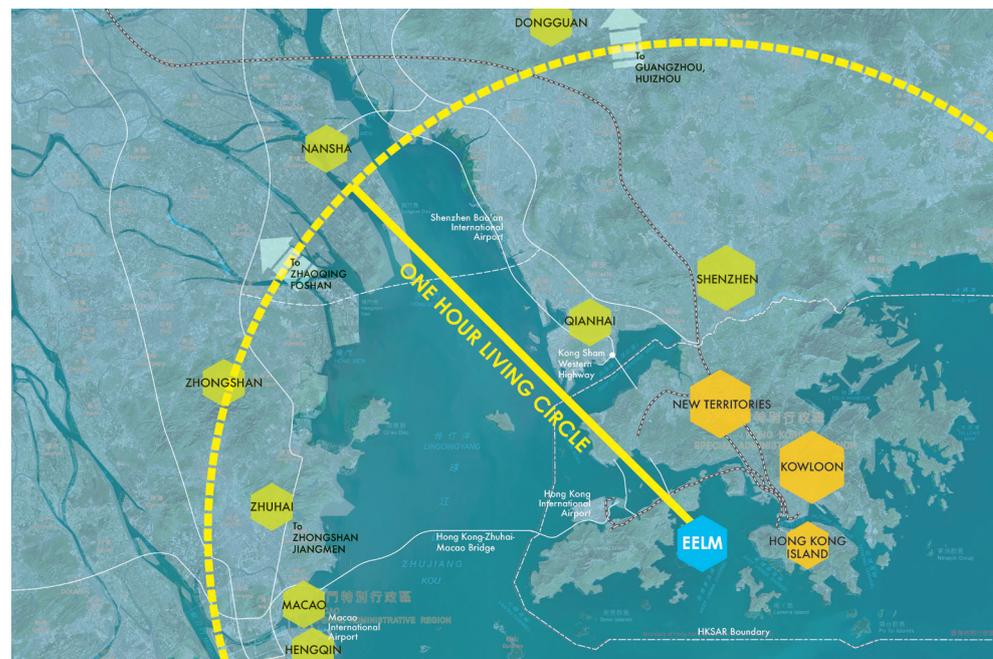
Source: Arup

The central strategic location of the EELM is significant and could be the future transportation hub for the city, as illustrated in Exhibit 21. We anticipate that the new road links will connect the EELM with Kennedy Town and Tuen Mun. The connection between Lantau Island and Central/Kowloon West can alleviate pressure on the Tsing Ma Bridge and enable quick access to the boundary control points. Also, with Tuen Mun West, which historically has been an industrial area, being connected, the whole area can be revitalised. Higher accessibility will be a crucial enabler in facilitating better utilisation, such as converting areas into residential or high value-added commercial land. Broadly speaking, these new road links could serve the function of the fourth harbour crossing, which will further alleviate congestion in the three cross-harbour tunnels.

Alongside new road links, railway links could also be built to actualise a “closed-loop” design to relieve congestion in New Territories West. Currently residents in New Territories West, such as in Tuen Mun and Tin Shui Wai for example, have long suffered from serious congestion especially in the morning peak hours. The West Rail Line has already reached full capacity, while Tuen Mun

Road congestion now starts around an hour earlier at 7am as compared to ten years ago<sup>66</sup>. With the connections of the EELM railway at Mei Foo Station and the future Tuen Mun South Station, a “loop” will be formed between the EELM railway and West Rail, which will provide an alternative to West Rail passengers, in particular those at the Tuen Mun area trying to access Hong Kong Island. Initial estimates show that peak hour passenger trips on the West Rail could potentially be reduced by 10 to 15%<sup>67</sup> when the new EELM line is built, helping alleviate the over-capacity issue on West Rail.

## EXHIBIT 22



CONNECTIVITY TO GREATER BAY AREA

Source: Arup

**The strategic location of the EELM could strengthen our leadership position in the Greater Bay Area and enable the concept of the “one-hour living circle”.** Located in the west of Hong Kong, it is strategically placed to connect to the nine cities in the Greater Bay Area through the Hong Kong-Zhuhai-Macao Bridge, as shown in **Exhibit 22**. Commuting to cities like Hengqin, Zhuhai or Foshan will take no more than an hour by high-speed railway. Just like the Greater Bay Area will gain increasing importance in China’s national plan, the EELM will enable us to seize opportunities within the area, and build more intimate and collaborative connections with neighbouring cities like Shenzhen and Guangzhou.

<sup>66</sup> Congestion peak hour has moved earlier from 8-9am to 7-8am in Tuen Mun Road according to average traffic data from the Transport Department

<sup>67</sup> Based on a preliminary prima facie technical study conducted by Arup.





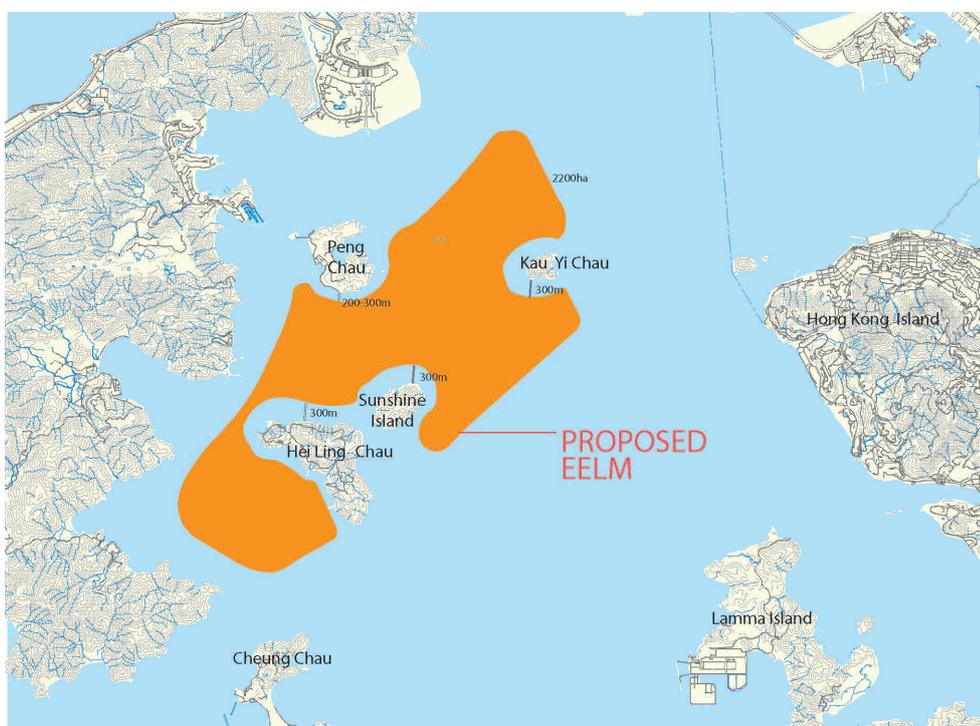
Chapter 4  
Technical  
Feasibilities

**These are “re-imaginings” for now, but could become a reality in the future.**

Our vision to enhance the city’s liveability and maintain our competitiveness should not be compromised when other major cities are continuously working their way to move ahead. This is a game-changer that could transform the city, a critical enabler that could ensure the city’s future prosperity for our next generation. This is also a realistic and actionable option – in our next chapter, we will show that rather than being a solution “too good to be true”, it is one that is entirely technically feasible to execute.

**A key focus of our research has been on ensuring that the proposal is feasible to implement, and is a solution worthy of further exploration.** Therefore, we engaged engineering professionals to conduct a preliminary technical feasibility study to draw out the tentative reclamation boundary of the EELM, as shown in **Exhibit 23**, which is both feasible to implement and visionary in terms of a future society.

### EXHIBIT 23



TENTATIVE RECLAMATION BOUNDARY OF EELM

Source: Arup

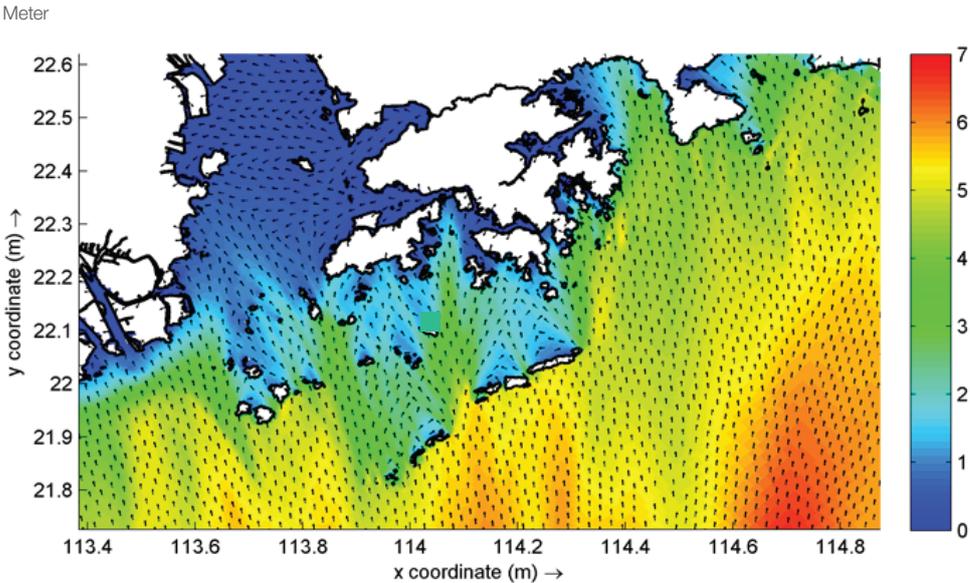
**Our technical feasibility analyses are evaluated keeping in mind three types of considerations – marine and reclamation requirements, institutional constraints, and environmental and fishery implications.** No insurmountable issues which would prevent the EELM proposal from being taken forward have been identified. In the following section of the chapter we illustrate the analyses conducted for each of these considerations.

### 1. Considerations on marine and reclamation requirements

- Wave and storm surge

Hydrodynamic and wave modelling, as shown in **Exhibit 24**, shows that the selected EELM site is shielded by existing islands further south and therefore the height of the wave during typhoons is limited to about 2 metres. This is considered sufficient to ensure the artificial island’s storm resilience.

#### EXHIBIT 24



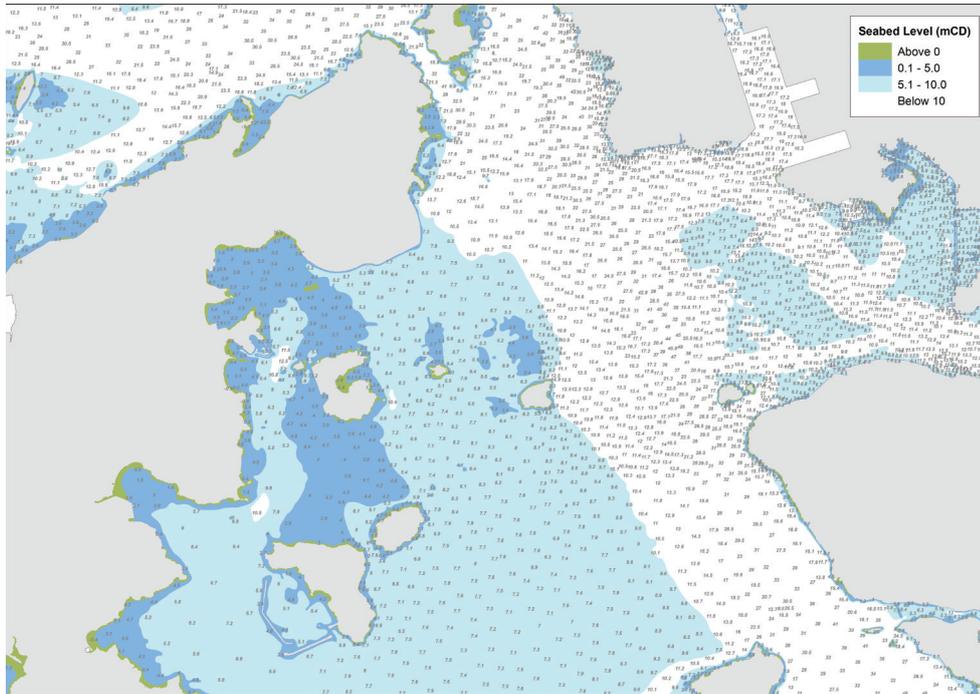
SNAPSHOT OF STORM SURGE HEIGHT (IN METRES) DURING PASSAGE OF A HISTORICAL TYPHOON NEAR / AT HONG KONG

Source: Arup

- Water depth

As shown in **Exhibit 25**, water depth at the proposed EELM site is about 4 to 8 metres, which is comparable to other near shore reclamations in Tung Chung, Tseung Kwan O and Chek Lap Kok. With Hong Kong's long history of successful reclamation to create land and new towns, there are no significant technical difficulties with regard to water depth.

## EXHIBIT 25

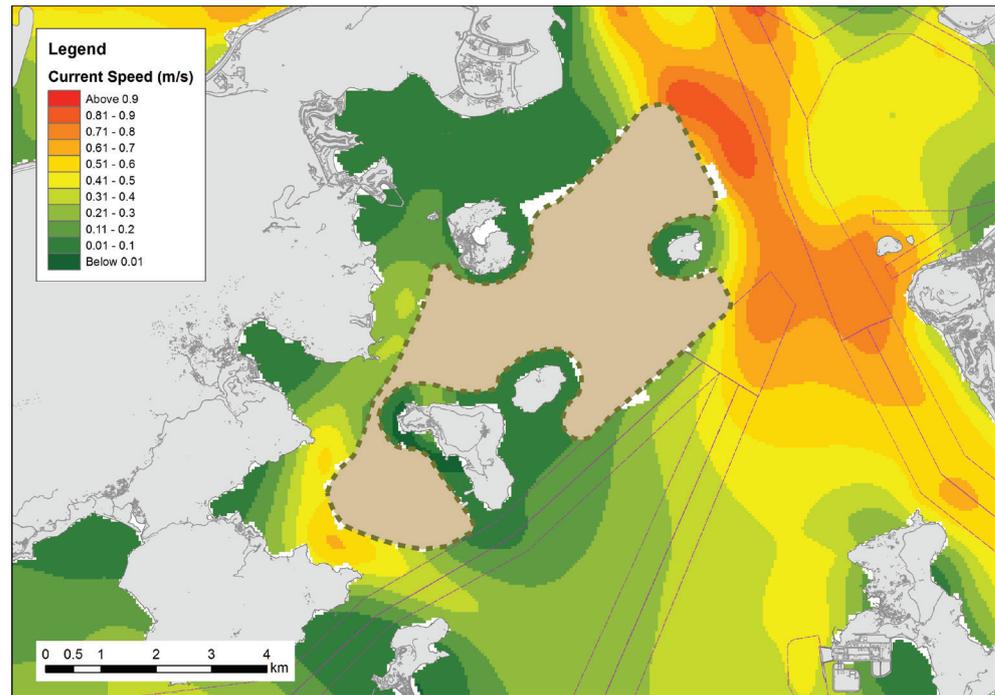


WATER DEPTH AT CENTRAL WATERS

Source: Arup

- Hydrodynamics

The preliminary assessment of the impact of the proposed EELM site on hydrodynamics shows that current speeds will remain acceptable and the hydrodynamic impact should not be significant (see **Exhibit 26**). The modelled area includes Victoria Harbour in the east, west Lantau in the west, Urmston Road in the north and the Hong Kong boundary in the south. This preliminary modelling was carried out for two months, in which bathymetry was input and digitised in the model based on the navigation charts available. Both the pre- and post-reclamation scenarios were assessed. The result shows that the current speeds are generally high – of about 1.0m/s along the Western Fairway in the east of the reclamation, and of about 0.6 m/s in the west of the reclamation. While preliminary results show that current speeds will not be too fast and there will be no significant impact on hydrodynamics, more refined modelling for longer modelling time shall be required of a detailed hydraulic study in the future.



HYDRODYNAMICS MODELLING WITH EELM

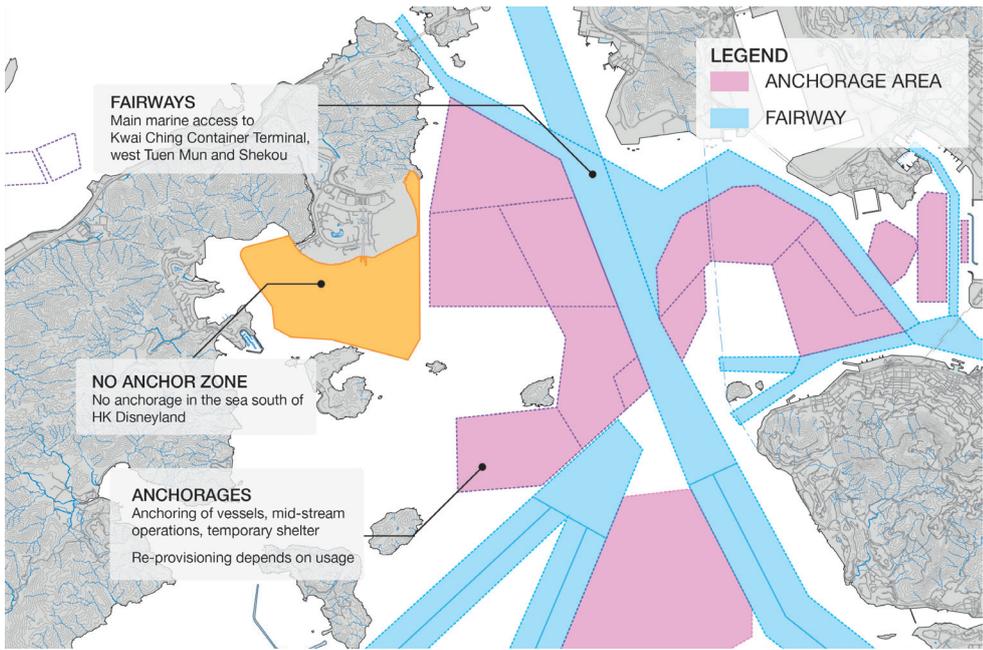
Source: Arup

- Marine traffic and operation

While there are major navigation channels and fairways in the Central Waters, the proposed EELM site should spatially avoid these navigation channels and leave a safe buffer distance between the edge of the reclamation site and fairway to uphold navigation safety (see **Exhibit 27**). We also acknowledge that there are a number of anchorage areas on the Central Waters for containerships<sup>68</sup> – while the proposed EELM site might overlap with these anchorages, re-provisioning before construction work begins will be manageable.

<sup>68</sup> These anchorages allow containerships to wait before moving into the Kwai Tsing Container Terminal, trans-shipment for mid-stream operations and refuge during typhoon attack.

EXHIBIT 27



NAVIGATION FAIRWAYS AND ANCHORAGE AREAS

Source: Arup

- Reclamation method

Reclamation without dredging is recommended as it is more environmentally friendly and will need comparatively less fill material, as illustrated in **Exhibit 28** below. It also helps preserve water quality and reduce the flow of dredgers travelling around the site. Meanwhile, a seawall foundation will need to be constructed – the current deep cement mixing method adopted by Hong Kong International Airport’s Third Runway and Tung Chung East reclamation shall be explored for the reclamation work in the EELM.

EXHIBIT 28

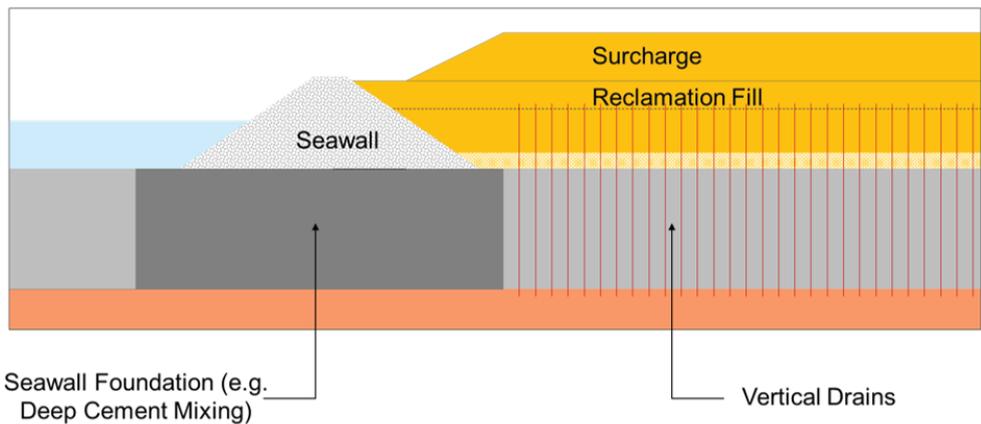


ILLUSTRATION OF RECLAMATION METHOD OPTION

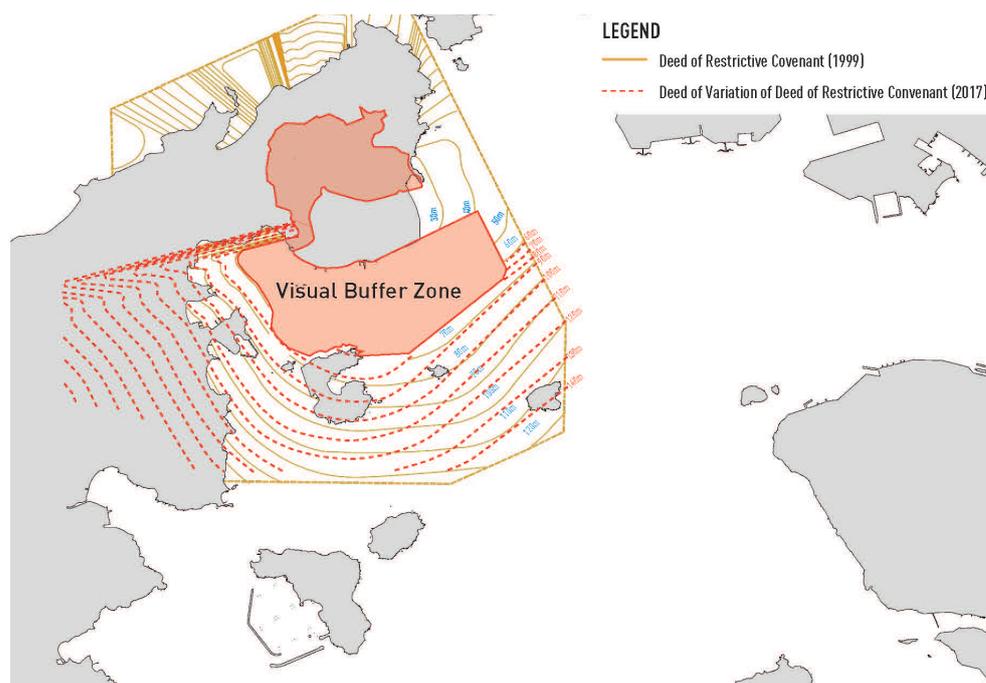
Source: Arup

## 2. Considerations on institutional constraints

- Disneyland Deed of Restrictive Covenant

The extent of the EELM's proposed reclamation will respect Disneyland's Deed of Restrictive Covenant with the government (see **Exhibit 29**) by avoiding encroachment into the Visual Buffer Zone and the No Anchorage Zone. The stepped building height restrictions can easily be accommodated in the future detailed design of buildings inside the EELM.

### EXHIBIT 29



DISNEYLAND DEED OF RESTRICTIVE COVENANT

Source: Arup

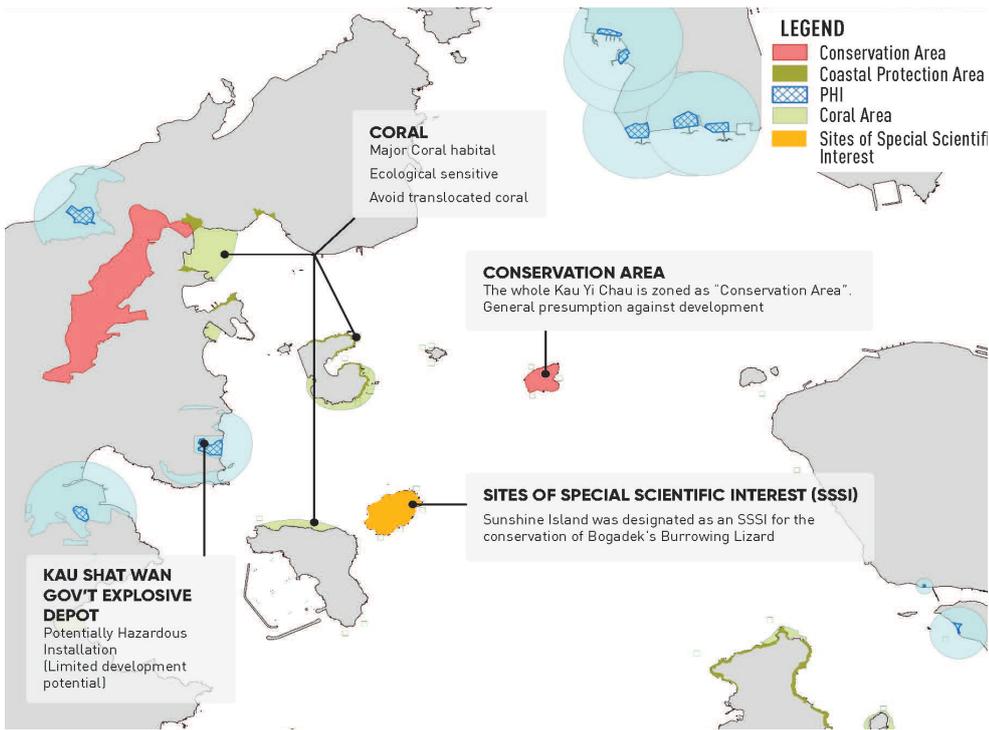
## 3. Considerations on environmental and fishery implications

- Environmental and ecological sensitive areas

We will keep a  
**200-300**  
metre buffer  
distance  
between  
natural  
coastlines of  
existing islands  
and the EELM

The shores of the existing islands in the Central Waters are generally ecologically-sensitive, and are zoned as Coastal Protection Areas and Conservation Areas, as shown in **Exhibit 30**<sup>69</sup>. Therefore, the proposed extent of reclamation for the EELM has taken into consideration the avoidance and minimisation of ecological and environmental impact by keeping a 200 to 300 metre buffer distance between the natural coastline of existing islands and the new reclamation island. Thereby, existing coral areas are preserved as much as possible, while coral translocation shall be prioritised whenever in situ preservation is unavoidable. Furthermore, the Kau Shat Wan Government Explosives Depot will be kept at a safe distance from the proposed EELM site to ensure safety and compliance with guidelines.

<sup>69</sup> Hong Kong and Planning Standards Guidelines (2017, March). Planning Department. Retrieved from [https://www.pland.gov.hk/pland\\_en/tech\\_doc/hkpsg/full/index.htm](https://www.pland.gov.hk/pland_en/tech_doc/hkpsg/full/index.htm)



KEY CORAL AREAS, CONSERVATION AREA AND PHI

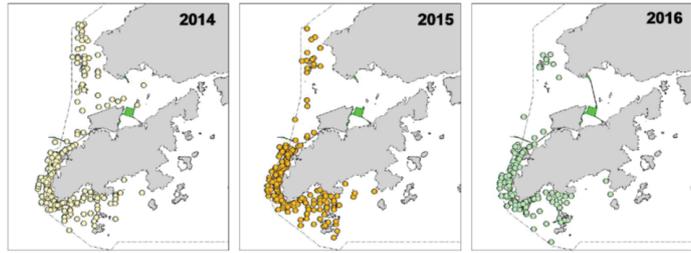
Source: Arup

- Marine ecology and special species

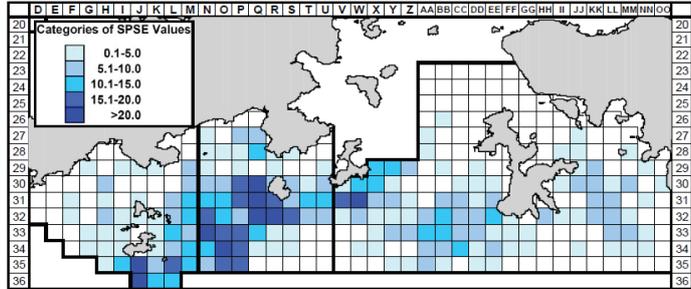
Contradictory to some beliefs, our study reveals that the proposed EELM site does not intersect with the major habitats of two beloved resident marine mammal species, the Chinese White Dolphin and the Finless Porpoise. Historical records suggest that both species are rarely spotted in the area of the EELM – Chinese White Dolphins generally reside on the west of Lantau Island, while Finless Porpoises utilise the waters south of the EELM (see **Exhibit 31**). The likely impacts on either of these species of such great conservational importance has been minimised by the selection of the site for the EELM, as the EELM site represents rather marginal habitats of the two species.

EXHIBIT 31

Distribution of Chinese White Dolphin



Density of Finless Porpoise



DISTRIBUTION OF CHINESE WHITE DOLPHIN AND FINLESS PORPOISE

Source: Arup

We have designed the coastlines of the EELM such that they do not disturb other special species, including the White-bellied Sea Eagle and Bogadek’s Burrowing Lizard. The former is present in the area in the vicinity of the EELM, and is classified as one of the species of conservational interest in Hong Kong. Meanwhile, the Bogadek’s Burrowing Lizard is a very rare reptile species endemic to Hong Kong, with only four known sightings recorded to date. To minimise disturbance, the EELM is designed to avoid the sea eagle’s nesting locations and the lizard’s habitat in Hei Ling Chau and Sunshine Island through the offsetting of coastlines, such that the EELM is not physically connected with these islands. The conservation and protection of these locations of key ecological significance shall also be further enhanced.

- Natural coastline, corals and fishery

The proposed EELM land formation avoids connection to natural coastlines to preserve the natural habitats of species of conservation interest and to minimise impact to coral communities around the islands. With the implementation of these practical mitigation measures to maintain water quality (e.g., use of silt curtain during marine works), corals in the coastlines near the EELM shall be minimally affected. Meanwhile, the impact to corals could be mitigated by coral translocation, which has been conducted for a number of projects in Hong Kong<sup>70</sup>. Furthermore, compensation projects could also be initiated to protect corals, such as the provision of a protected area as a nursey of transplanted corals.

<sup>70</sup> Coral translocation has been conducted in development projects of Kai Tak Development, Tuen Mun – Chek Lap Kok Link, the Expansion of Hong Kong International Airport into a Three-Runway System and Tseung Kwan O – Lam Tin Tunnel.

We also acknowledge the concerns from the fishing community regarding the loss of fishing ground and changes in water quality. Although the EELM is not located within the recognised southern Lantau spawning ground and nursery area, the impact on the fishery sector, specifically those home ports that utilise the waters of the EELM and mariculturists of the Fish Culture Zones (FCZs) nearby, must not be neglected. To mitigate the impact, the option of temporary or permanent relocation of fish culture rafts, relocating the concerned FCZ or expanding other existing FCZs, could be explored to address their concerns. Potential sites for relocation or expansion near the EELM could be earmarked, where aquaculture enhancement measures, could be considered. Other fisheries enhancement measures<sup>71</sup> to upgrade the aquaculture activities, such as aquaponics and indoor aquaculture, could also be explored to provide sustainable alternatives to fishermen and mariculturists affected by the EELM. This would require a frequent and intimate conversation between the government and the fishery sector to assure the sector that these relevant measures shall be incorporated in the final island design and implementation.

**We believe that the EELM shall be technically feasible to implement and that careful urban planning using a “smart-green-resilient” concept shall enable the place to become sustainable, people-centric, vibrant and liveable.** For example, good planning of land use among residential, commercial, GI/C facilities and other infrastructure could provide a desirable air quality environment for users. Regulating building heights and plot ratios could also ensure adequate air ventilation and acceptable population density. Ultimately, the EELM shall be the land of re-imaginings and renewal – it will become the backbone of our liveability vision for Hong Kong, and a game-changer that will resolve many of our existing and upcoming challenges.

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<sup>71</sup> Examples include integrated multi-trophic aquaculture (i.e. culturing finfish in combination with other organisms from different trophic levels that utilise waste particulates and dissolved nutrients), offshore/deep sea mariculture with submerged or semi-submerged cages, and recirculation aquaculture system.





## Chapter 5

# Addressing Some Common Concerns

As with all major projects of this scale, we acknowledge that there will be different concerns from major stakeholders. In this chapter, we will try to give our initial perspectives on all potential key questions.

## CATEGORY 1 - HOUSING

### Key questions:

#### 1. What will be the impact of the Enhanced-ELM project on land and housing prices?

**We anticipate the impact on land and housing prices to be within control and manageable.** Reclamation takes at least 11 years, including the technical feasibility analysis, environmental impact assessment (EIA), etc. Given its colossal scale (2,200 hectares), the Enhanced-ELM is likely to be completed in a phased approach – our preliminary plan shows that it could be done in two phases. This means the land created will come to the market gradually over a long period of time, spreading the increase in land supply across a longer term. In addition, the government can always put the newly reclaimed land into a “land bank” and release the land according to the prevailing market and economic situation, thereby effectively neutralising any negative supply shock to the market.

#### 2. What is the public housing policy with this new land?

**We are partial to a higher public housing ratio compared to the government’s guidance with this land.** We propose that at least 70% of residential units should be allocated for public housing supply. The increased proportion from the public side should be contributed by a higher number in SHS units. The SHS is a housing strategy advocated by OHKF, focused on multiplying the incidence of homeownership among low-income households. The policy aims to mend the broken housing ladder, allow low-income households to enjoy the capital gain brought about by economic growth, and narrow the economic and social divide due to the inequality of housing.

We propose that at least **70%** of residential units should be allocated for public housing supply

## CATEGORY 2 - ENVIRONMENT

### Key questions:

#### 1. How do we minimise the environmental harm from construction?

**On the basis of sustainability, reclamation without dredging is recommended as this would be more environmentally friendly and will need less fill material than reclamation with dredging.** Reclamation without dredging helps preserve water quality and reduces the flow of dredgers travelling around the site. This method will reduce suspended particles without dumping marine sediment. With the concerns over ecological sites that may be affected, our plan has already identified and avoided the habitats of ecological significance to minimise damages and disturbances. For example, the plan will provide a 200 - 300-metre waterway away from Sunshine Island which is the living ground of Bogadek’s legless lizard, and Kau Yi Chau, which is zoned partly a Conservation Area (CA). The waterway will be used to maintain water circulation and flushing capacity of the surrounding water bodies.

## 2. How do we mitigate the potential harm to the environment?

**A mitigation and ecological compensation approach could be adopted on a territory-wide level.** For example, the government could set up additional marine parks and reserves. It could also set aside funds to create research/ conservation centres to reproduce endangered species, like Romer's Tree Frog, in the laboratory of the University of Hong Kong. Green solutions could also be rolled out in the entire EELM, systematically reducing energy consumption for one-eighth of Hong Kong's population.

**In fact, we have also considered multiple ways to compensate the potential harm brought by the EELM through the design of the reclamation site itself.** Firstly, the artificial seawall of the new land formation of the EELM has the potential to provide habitats that can enrich or enhance the marine biodiversity and ecological value of the area if appropriately designed ("eco-shorelines"). The ecological design could be tailored to the exact objectives and target species. For example, eco-shorelines to suit mudflat or wetland for shallow water zones in the vicinity of the EELM could be explored.

**Secondly, ecological enhancement measures such as deployment of artificial reefs (AR) could also be explored as part of the EELM implementation works.** A number of studies have been performed to measure the success of the AR deployed in Hong Kong waters, and the findings have concluded that through the selection of deployment site and appropriate design of materials, AR in Hong Kong have been shown to have the potential to attract juvenile and adult fish communities to stay as well as macro-benthic organisms on the structures themselves<sup>72</sup>.

**Green solutions can also be implemented at scale on the EELM to maximise the community's environmental capacity to mitigate such harm.** For example, the new sewerage system of EELM could be designed to include tertiary treatment, effluent polishing and disinfection, etc. so that the treated effluent would be of good quality. This system at the EELM offers an opportunity to connect with those systems of the nearby outlying islands such that wastewater from the broader catchment could be processed at a centralised sewage treatment works and treated to the same high level. Treated effluent can be considered for re-use onsite at the EELM for general washing, toilet flushing, watering of landscaping works, etc. so that there might be minimal effluent discharge to marine waters. With such an arrangement, there is a potential that existing water quality might be improved due to the provision of higher treatment level for wastewater that is currently processed at primary treatment only or discharged untreated (for households that are not connected to the public sewerage system).

**Moreover, there could be a spill-over effect to improve the environmental situation of other urban districts in Hong Kong as well.** As the EELM is expected to support the redistribution of populations and traffic in areas that are currently densely populated or congested (e.g., Yau Tsim Mong District), it has the potential to improve the air quality and noise conditions in these areas.

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<sup>72</sup> AFCD (2003), Assessment of Fishes Associated with Hong Kong Artificial Reefs Using Underwater Visual Surveys.

## CATEGORY 3 - TRANSPORTATION

### Key questions:

#### 1. What are the modes of transportation between the EELM and the external areas?

We envision that most EELM passenger trips to external districts will be by rail transport. The remaining trips will be by other public modes of transport as well as by private transport.

Three road connections can be built to accommodate the road-based travel demand at Kennedy Town, Lantau Link near Tai Ho, and the future Route 11.

Three rail connection points would be required to cope with the anticipated demand from the EELM. The suggested connections are Kennedy Town Station, Mei Foo Station, and the future Tuen Mun South Station.

#### 2. How will the EELM affect the capacity of the current transportation system?

With connections at Mei Foo Station and the future Tuen Mun South Station, a “loop” is formed between the EELM railway and West Rail. This will provide an alternative to West Rail passengers – particularly those in the Tuen Mun area such as Tuen Mun Central, Tuen Mun South, Siu Ho Wan and Hung Shui Kiu – to access Hong Kong Island. We anticipate a 10-15% reduction of peak hour passenger trips on the West Rail.

New road connections should be carefully assessed to optimise connectivity and avoid overloading existing networks. For highway design, an appropriate interchange and connection scheme should be devised to achieve road network safety and efficiency.

## CATEGORY 4 - COMPARISON TO OTHER INITIATIVES

### Key questions:

#### 1. How do its costs compare to other alternatives?

Reclamation costs ~HK \$1,360 per sq ft, comparable to resuming private farmland in the New Territories

**Land costs:** We have engaged with Arup for an established prima facie feasibility report for the EELM. As per the report, the estimated broad-brush costs of reclamation for the EELM are around HK\$1,360 per sq ft at January 2018 prices. This number is comparable, if not less, than resuming private farmland in the New Territories. As of the 1st of April 2018, the ex-gratia compensation rate for land resumption of agricultural land is in the range of HK\$312 to HK\$1,248 per sq ft, depending on location. As a practice, 25% allowances for crop compensation and other losses are added, leading to a range of HK\$390 to HK\$1,560 per sq ft. For resumption of land for development of New Town purposes, the compensation of the land would fall in the higher range of HK\$1,248 and HK\$1,560 per sq ft. This will then be comparable, if not higher, to the estimated broad-brush costs of reclamation for the EELM. An advantage of the EELM is that the created developable land is continuous and large scale, as opposed to being scattered and piecemeal pockets of land under resumption, allowing for more comprehensive urban development where resources are shared.

**External infrastructure requirements:** Both the development of the EELM and development after resuming existing land for example in the New Territories would require the provision of new external transport infrastructure such as railway and highway connections. Leveraging existing infrastructure for the development of existing land in New Territories is hardly possible as the maximum capacity of the existing transport infrastructure has been reached in many cases. One example is the New Development Area (NDA) for Yuen Long South, where improvement to the Yuen Long Highway is required as the existing capacity is not sufficient to support a relatively small scale development proposed for Yuen Long South. The large-scale development of the New Territories North (NTN) would require new strategic railway and road links as the capacity of the existing transport infrastructure is not sufficient to support any new development. The transport infrastructural links, including highway and railway, to the EELM will need to cross the channel, requiring either a long span bridge or a subsea tunnel. In general, when developing new towns in the New Territories highway and railway connections in the form of bridges and tunnels going through mountains and underneath urbanised areas are required and have an average cost that is comparable to those required for the EELM. While for both scenarios the construction of new transport infrastructure link is necessary, the large and continuous developable land of the EELM will allow external infrastructural links to be fully optimised and the highest cost effectiveness to be achieved.

**Internal infrastructure and GIC requirements:** Assuming the same population size and development area, the basic infrastructural (like road, water and sewerage) and GIC requirements are similar under both scenarios of reclamation and land in existing unformed land. However, the EELM again has a benefit as these facilities can be implemented in a more integrated manner and thus achieve the highest cost effectiveness.

## **2. How does its time frame compare to others – will this be too long term?**

**The EELM and the other options are not an either-or; and it is by no means a replacement of the other options.** Short-to-medium term solutions are necessary to pursue and alleviate the most urgent concerns, yet they will also result in long-term issues. For example, the current urban renewal effort will further intensify density issues and developing brownfield doesn't give existing business an alternate relocation. The EELM will benefit Hong Kong as a "game-changer" – large enough capacity to enable efficient planning and cost-effective construction to re-imagine Hong Kong.

**A lot of these concerns could potentially be addressed with the right type of supportive government policies.** This will require leadership and conviction from the Hong Kong government and stakeholders. However, the key is that we will have another 10 to 15 years to think about the most optimal solutions to these concerns when we have kickstart the construction of the EELM.





Chapter 6

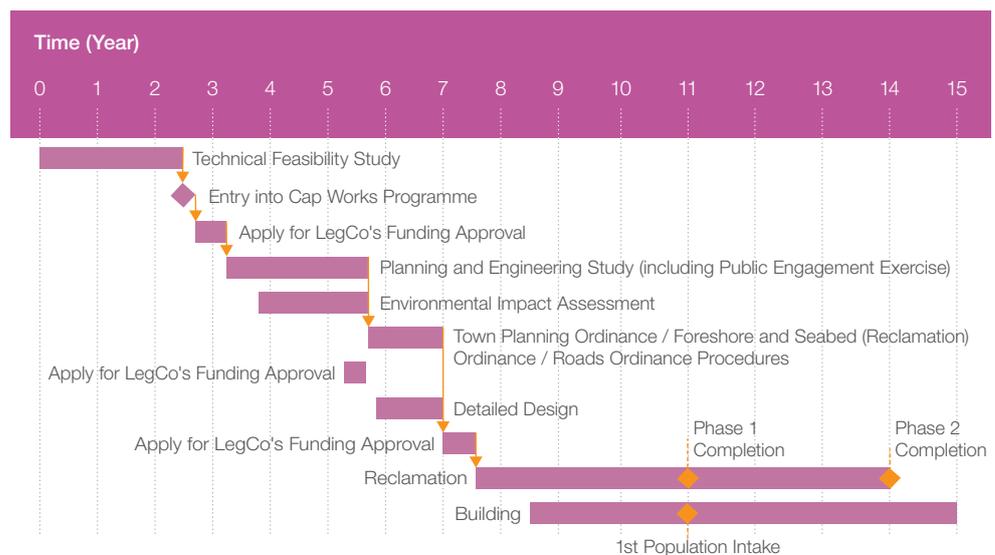
# Moving Ahead For Consensus

**There is no question that HK needs more land.** All 18 options proposed by the Task Force should be explored, but there is only one – large scale reclamation – that will change the game for our future. Reclamation is a game-changer because it allows us to advance our competitive position across many dimensions. We can finally give hope to the public who are waiting for affordable housing; we can improve our quality of living with the new green urban planning initiatives; and we can improve our different industries by providing them with more lands.

The first phase of the EELM could be completed in 11 years

**The first phase of the EELM could potentially be completed in 11 years for residents to move in.** Currently the government estimates that a typical reclamation project would only take a total of 11 years<sup>73</sup> – this includes technical feasibility studies, applications for funding and liaising with the government departments that it would be responsible for. Given the scale of the EELM, we believe that it could potentially take longer to complete the whole project. Therefore, together with engineering professionals, we have crafted a preliminary implementation timeline for the EELM, adopting a phasing approach to ensure that the public can enjoy its benefits as soon as possible. Referring to **Exhibit 32**, Phase 1 could be completed in 11 years after the commencement of technical feasibility study, and Phase 2 completed 3 years later, i.e., 14 years in total. Transport links could also be built simultaneously to ensure that even the first batch of residents can enjoy high accessibility both within the island and connecting to other parts of Hong Kong.

### EXHIBIT 32



**IMPLEMENTATION PROGRAMME OF EELM (2,200 HA)**

Source: Arup, Task Force on Land Supply

**Past major infrastructure projects in Hong Kong have always taken a much longer time than expected to deliberate and reach consensus prior to the actual construction.** Hong Kong International Airport (HKIA)'s third runway project started being discussed in 2008 when the master plan was compiled. It took a whole 8 years before actual construction began and another 7 years will pass before it can be used in 2023 (see **Exhibit 33**). From start to finish, the whole project will take a total of 15 years if there are no delays with construction. This is much longer when compared to Changi Airport's third runway expansion, which

<sup>73</sup> 維港以外填海 (2017, November 7). Development Bureau, The Government of Hong Kong. Retrieved from [https://www.devb.gov.hk/filemanager/tc/content\\_1054/Paper\\_07\\_2017.pdf](https://www.devb.gov.hk/filemanager/tc/content_1054/Paper_07_2017.pdf).

will only take around 8 years from planning to completion<sup>74</sup>. We also see delays in many ongoing infrastructure projects right now, including the likes of the new MTR lines and the Hong Kong-Zhuhai-Macau Bridge.

### EXHIBIT 33



#### COMPARISON OF THIRD RUNWAY PROJECTS OF HONG KONG INTERNATIONAL AIRPORT AND CHANGI AIRPORT

Source: Airport Authority, Press search

Nevertheless, it is not as if Hong Kong has never been able to ramp up our timeliness in infrastructure construction. Also associated with the HKIA, the “Hong Kong Airport Core Programme”, also widely known as the “Rose Garden Project”, only took eight years to complete. With ten “core projects”<sup>75</sup> under its belt, including most notably HKIA, Airport Railway, Tsing Ma Bridge, the Western Harbour Tunnel etc., the projects were still delivered on time with the opening of HKIA in July 1998. If we could do it then, with determination and technology advancement, we should be able to accomplish again, but be better, bigger and faster in our infrastructural aspiration.

Therefore, we need an accelerated “fast track” for the EELM in order for it to be relevant to our current debate. Reclamation takes time but for a massive project of this scale, we also need time to design appropriate policies to facilitate the implementation. Therefore, we should explore whether there is a “fast track” for this proposal to come to actuality. This would require close cross-bureau collaborations to ensure efficiency; with strong advocacy, conviction and leadership from the very top of the administration. This would also require a united vision of “a better Hong Kong” from all stakeholders. Otherwise, Hong Kong may need to wait another two decades for this solution to come to fruition. This will require leadership and conviction from the Hong Kong government and stakeholders.

We should explore a “fast track” for this proposal to come to actuality

<sup>74</sup> There are some differences between HKIA and Changi Airport's third runway project – while HKIA's is built from scratch to a 4km runway, Changi Airport's plan is an extension of a shorter military-only runway (2.75km) to a full-length (4km) joint military-civilian runway.

<sup>75</sup> “Ten Core Projects” include the Hong Kong International Airport, Airport Railway, Lantau Link (Kap Shui Mun Bridge and Tsing Ma Bridge), Western Harbour Crossing, North Lantau Expressway, Route 3, West Kowloon Highway, Reclamation in West Kowloon, Central Reclamation Phase 1 and Phase 1 of North Lantau New Town.

**There is too much at stake for delaying it or not doing it.** A land reserve is not only an asset for Hong Kong's citizens, but also an enabler for industry development and urban renewal. The upside is huge – what's at stake is our future, and the city's competitiveness against other metropolises in the next thirty years and more to come. Many of our neighbouring Asian cities have been proactively developing capacity and land supply for years. They have developed their vision for their city of the future and how they can potentially become the best liveable city in the region. We are already behind in terms of creating new land capacity, leading to our current predicament. We should have the vision to re-imagine our city, to fundamentally change our attitude and methods towards planning, to have the "urgency mindset" to immediately start working on a plan that will only bring about mid-to-long-term benefits to Hong Kong. The alternative, is that all of us will have to continue to suffer through more of what we have been going through in the past decade.



# About the Author

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OUR HONG KONG  
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**Our Hong Kong Foundation** is a non-government, non-profit organization dedicated to promoting the long-term and overall interests of Hong Kong through public policy research, advocacy and engagement. Pooling together local, mainland and international talent, the Foundation studies Hong Kong's short, medium and long-term development needs, offering multidisciplinary public policy recommendations and solutions to foster social cohesion, economic prosperity and sustainable development.

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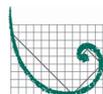
**McKinsey & Company** is a global management consulting firm that serves a broad mix of private, public and social sector institutions. It helps its clients make significant and lasting improvements to their performance. McKinsey provided economic analysis and research for this report, which draws on multiple sources including interviews and data from government departments.

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**Arup** is the creative force at the heart of many of the world's most prominent projects in the built environment and across industries. The firm has more than 14,000 designers, engineers, planners and consultants in 87 offices across 34 countries, delivering innovative projects across the world with creativity and passion. Since its founding in 1946, Arup has pioneered groundbreaking strategies, and pursued technical excellence and social purpose to shape a better world.



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## **Key Contributor**

### **Our Hong Kong Foundation**

Eva Cheng – Executive Director

Stephen Wong – Deputy Executive Director and Head of Public Policy Institute

Ryan Ip – Senior Researcher

## **Knowledge Partner Contributors**

### **McKinsey & Company**

Joseph Luc Ngai – Senior Partner and Managing Partner of Greater China

Raymond Woo – Associate Partner

Grace Lam – Business Analyst

### **Arup**

Wilfred Lau – Arup Fellow | Director

Davis Lee – Director

Peter Chan – Associate Director

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Mr Stephen Wong  
Deputy Executive Director and Head of Public Policy Institute  
Our Hong Kong Foundation  
Email: [stephen.wong@ourhkfoundation.org.hk](mailto:stephen.wong@ourhkfoundation.org.hk)

Mr Ryan Ip  
Senior Researcher  
Our Hong Kong Foundation  
Email: [ryan.ip@ourhkfoundation.org.hk](mailto:ryan.ip@ourhkfoundation.org.hk)

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