



# 都大講堂



Talk of the Metropolis







**FROM BARREN ROCK TO METROPOLIS;  
TO GREENER, SMARTER & HAPPIER**

Ir Aaron Bok  
President, HKIE

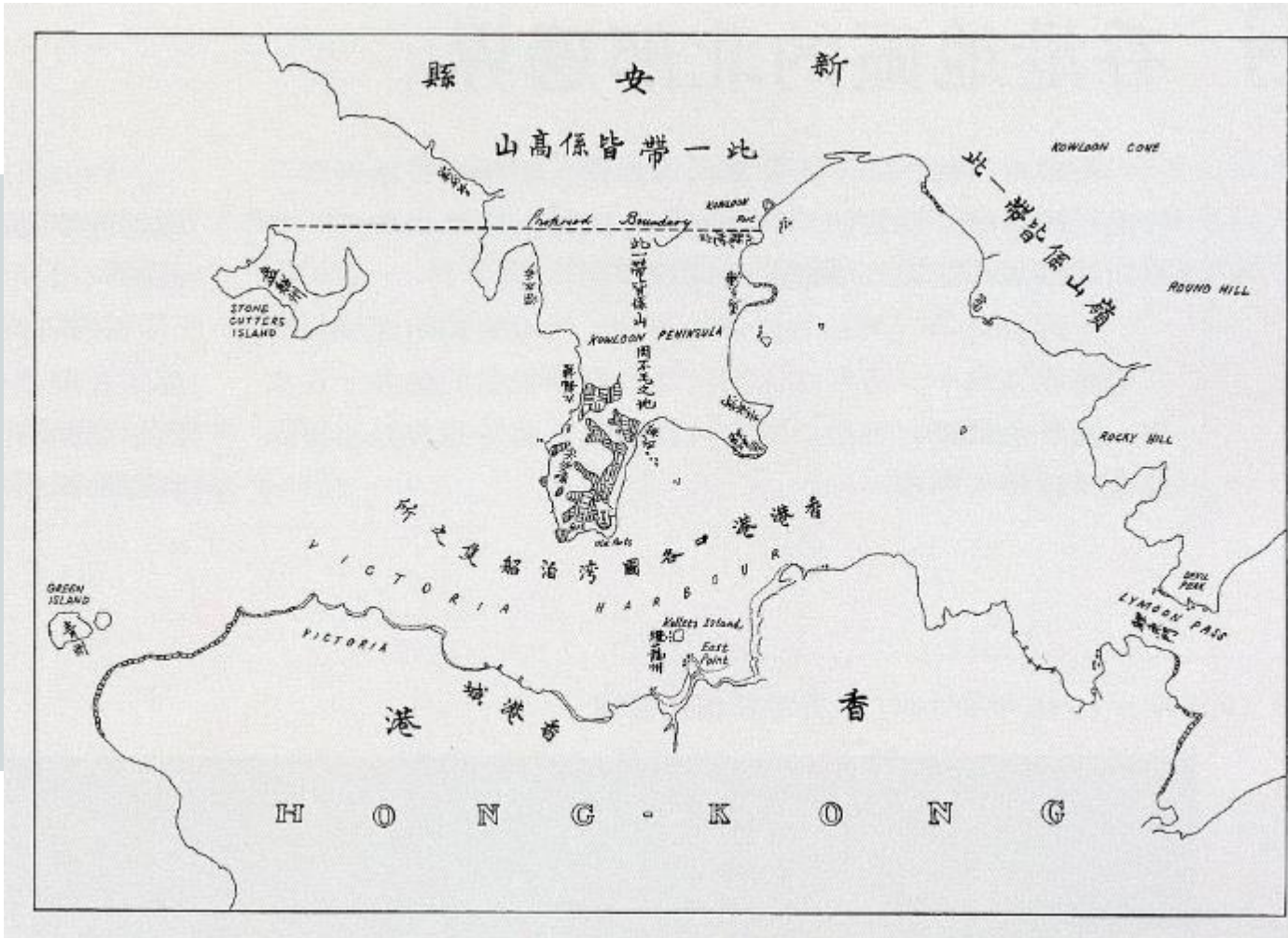
# BARREN ROCK

- 1842 Nanking Treaty
- 1860 Peking Treaty
- 1898 2<sup>nd</sup> Peking Treaty



# EARLY SETTLEMENT

Only 82 sq km Usable lowland only 3%



# EARLY SETTLEMENT

First reclamation in 1852-59 : Bonham Strand



# KOWLOON & NEW TERRITORIES

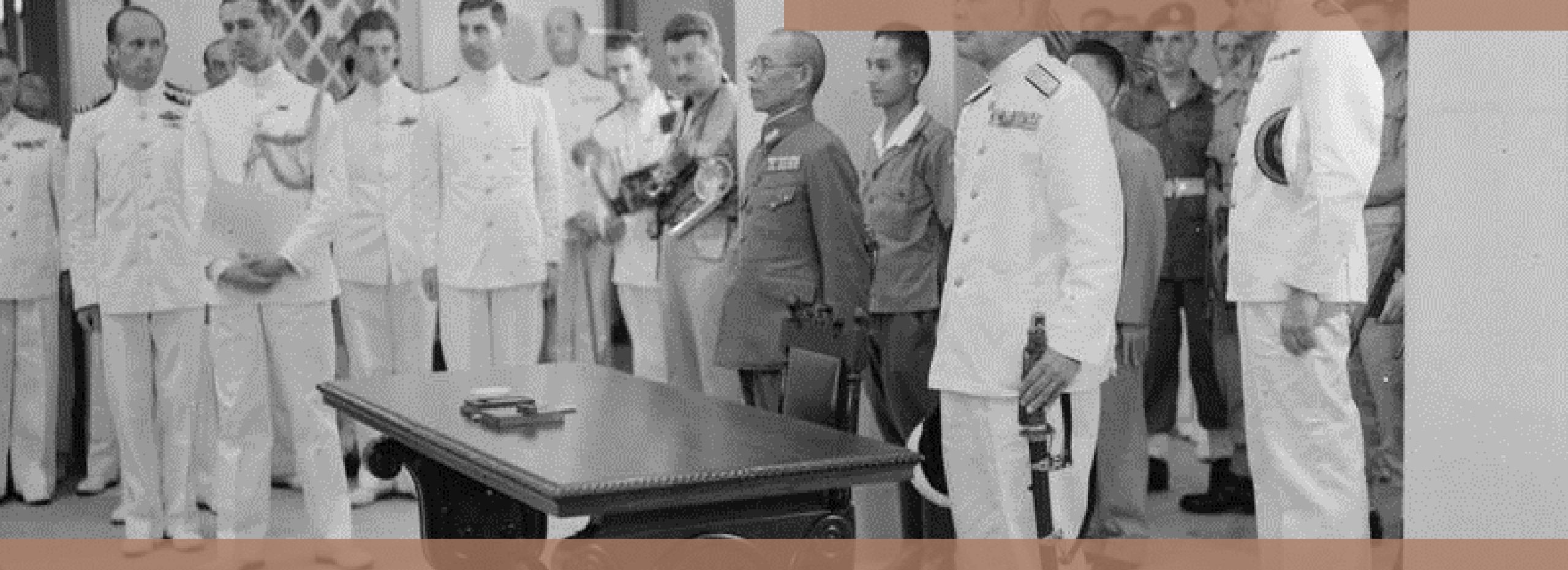


Tsim Sha Tsui



Kowloon Tong





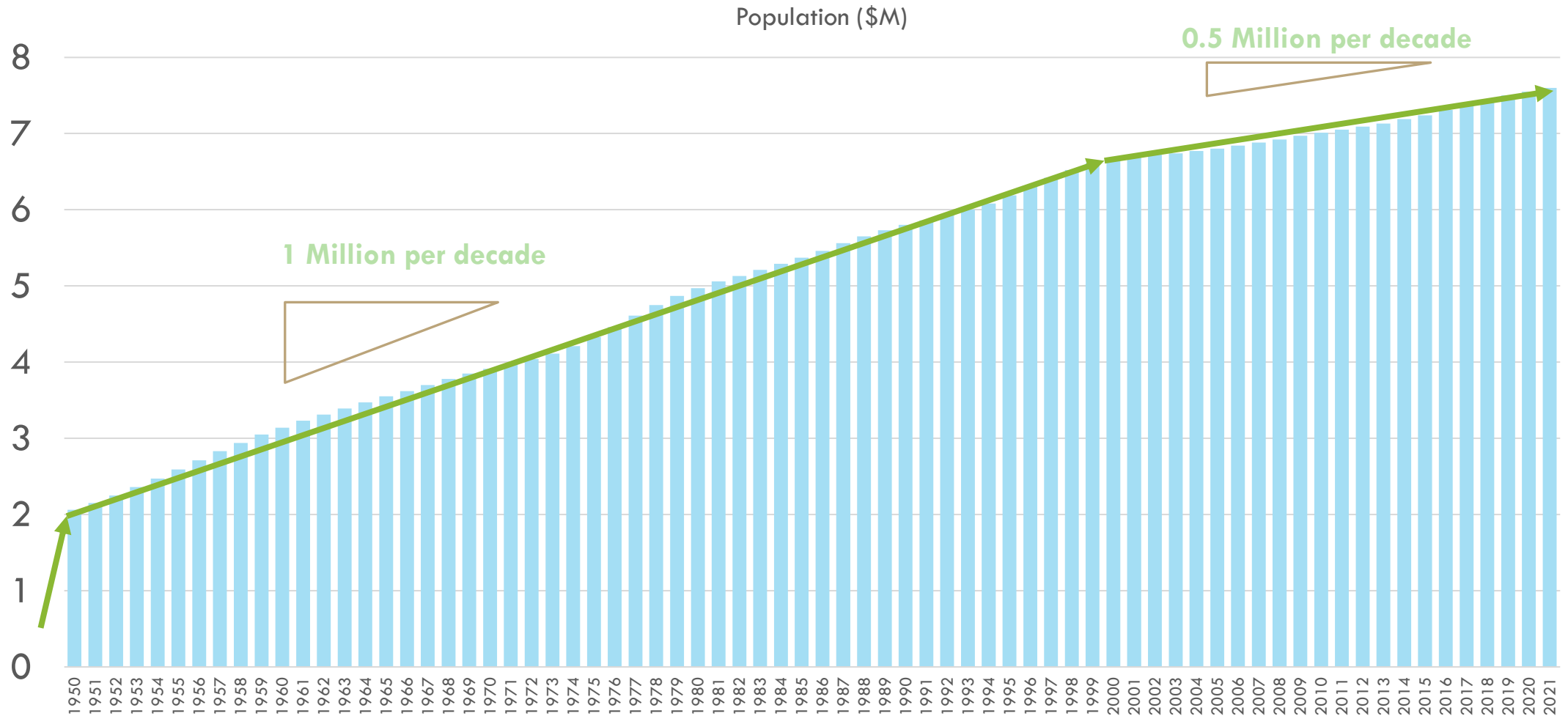
## POST-WAR GROWTH IN HONG KONG

### Population:

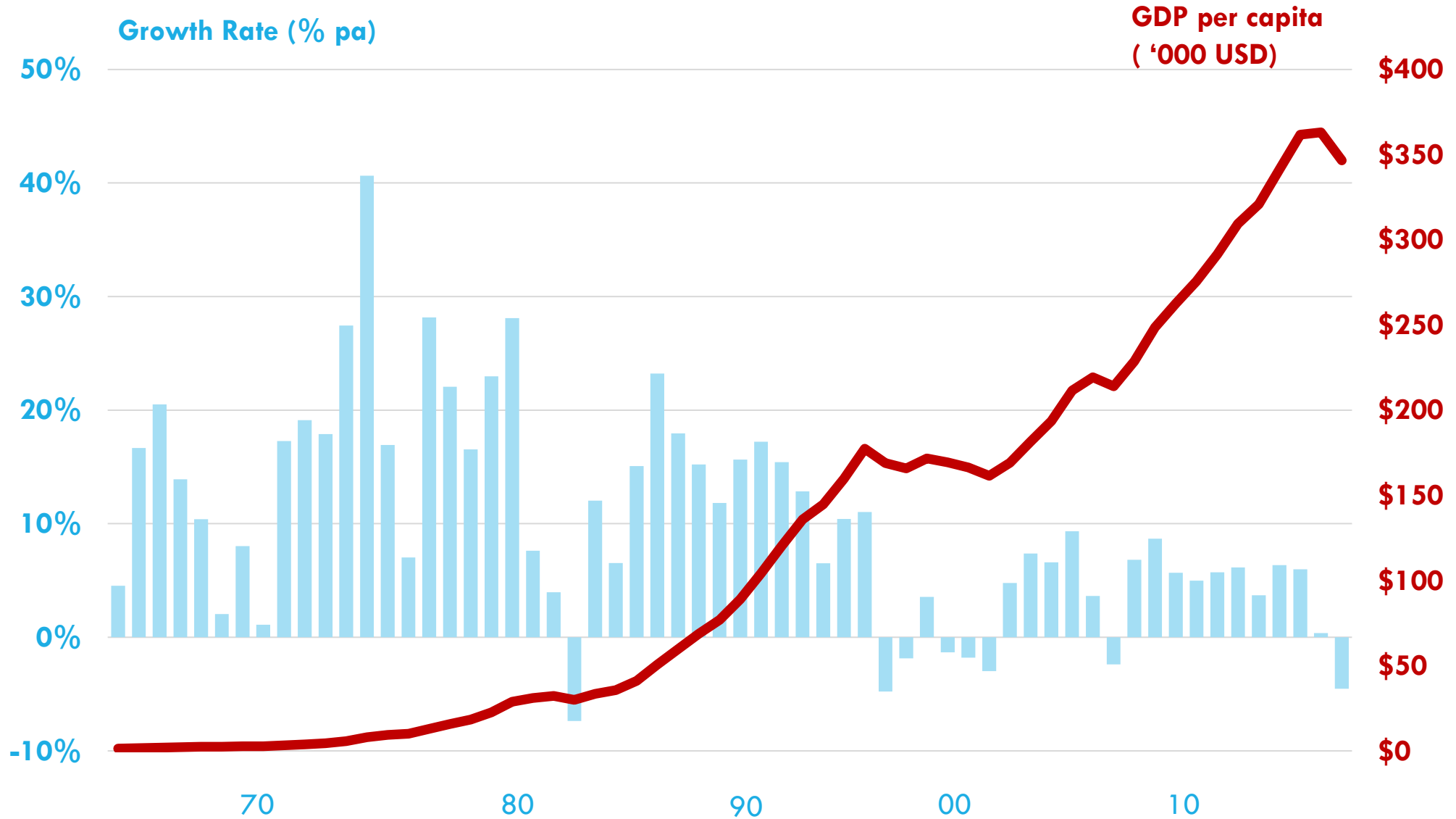
Pre-war 0.8M to 1.6M in 1941, then drop to 0.6M.

Post-war — new growth

# GROWTH IN HONG KONG



# GROWTH IN HONG KONG



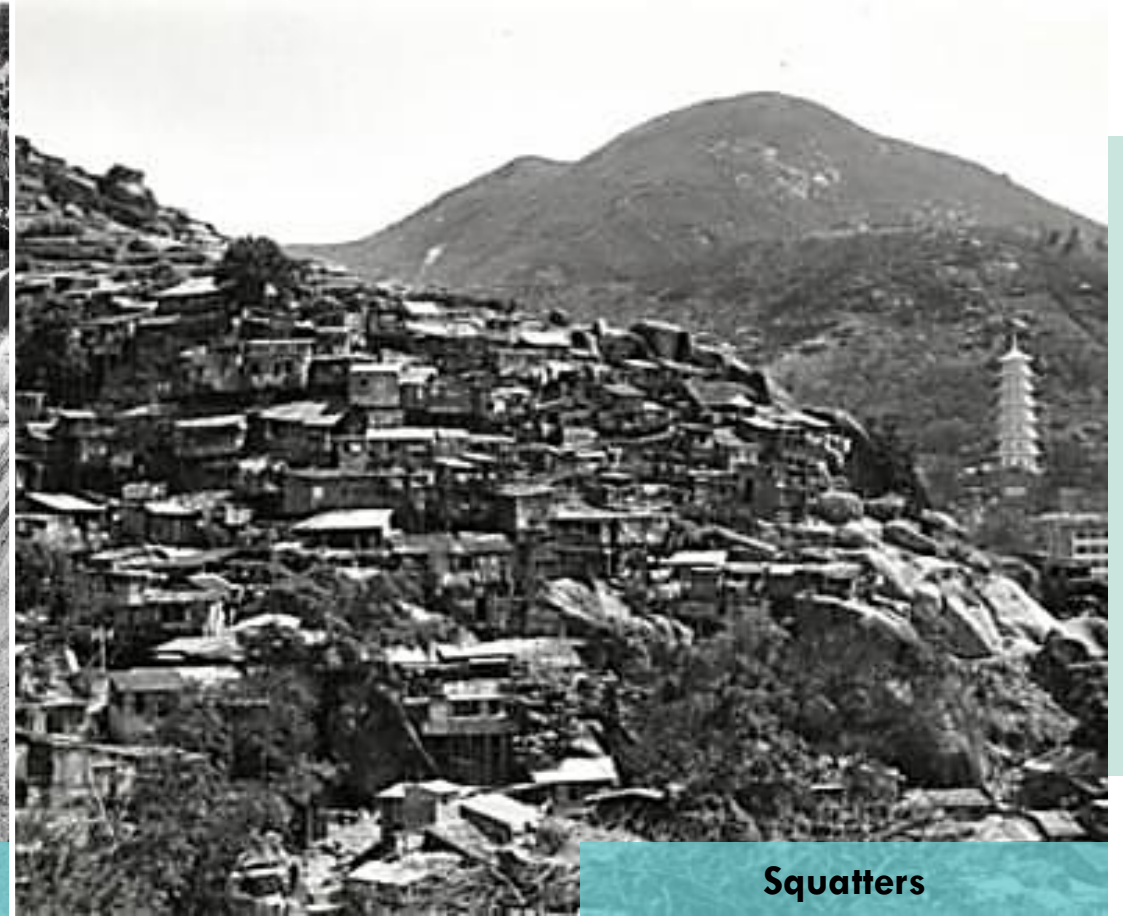
1950S - 1960S  
REBUILDING FROM  
RUIN



# EARLY DAYS



**Water Shortage**



**Squatters**

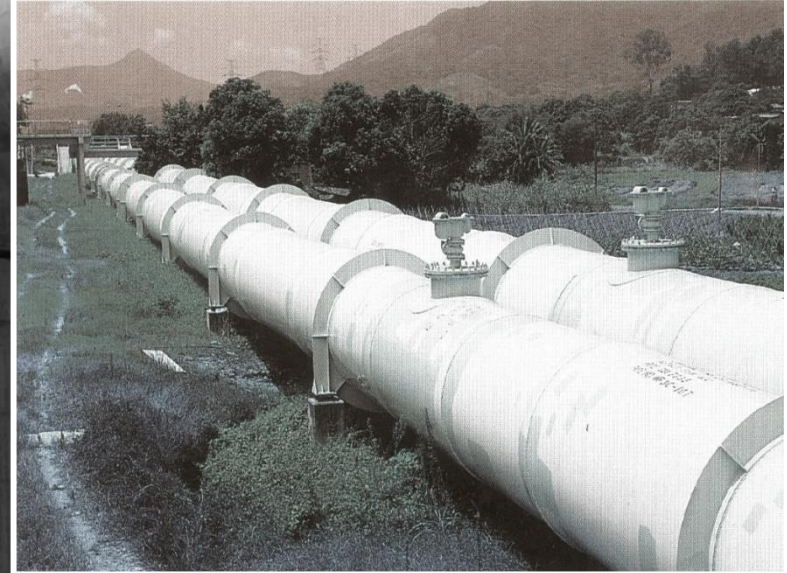
# WATER SUPPLY



# WATER SUPPLY



**Concealed Aqueduct**



**Dongjiang Water**

# HOUSING

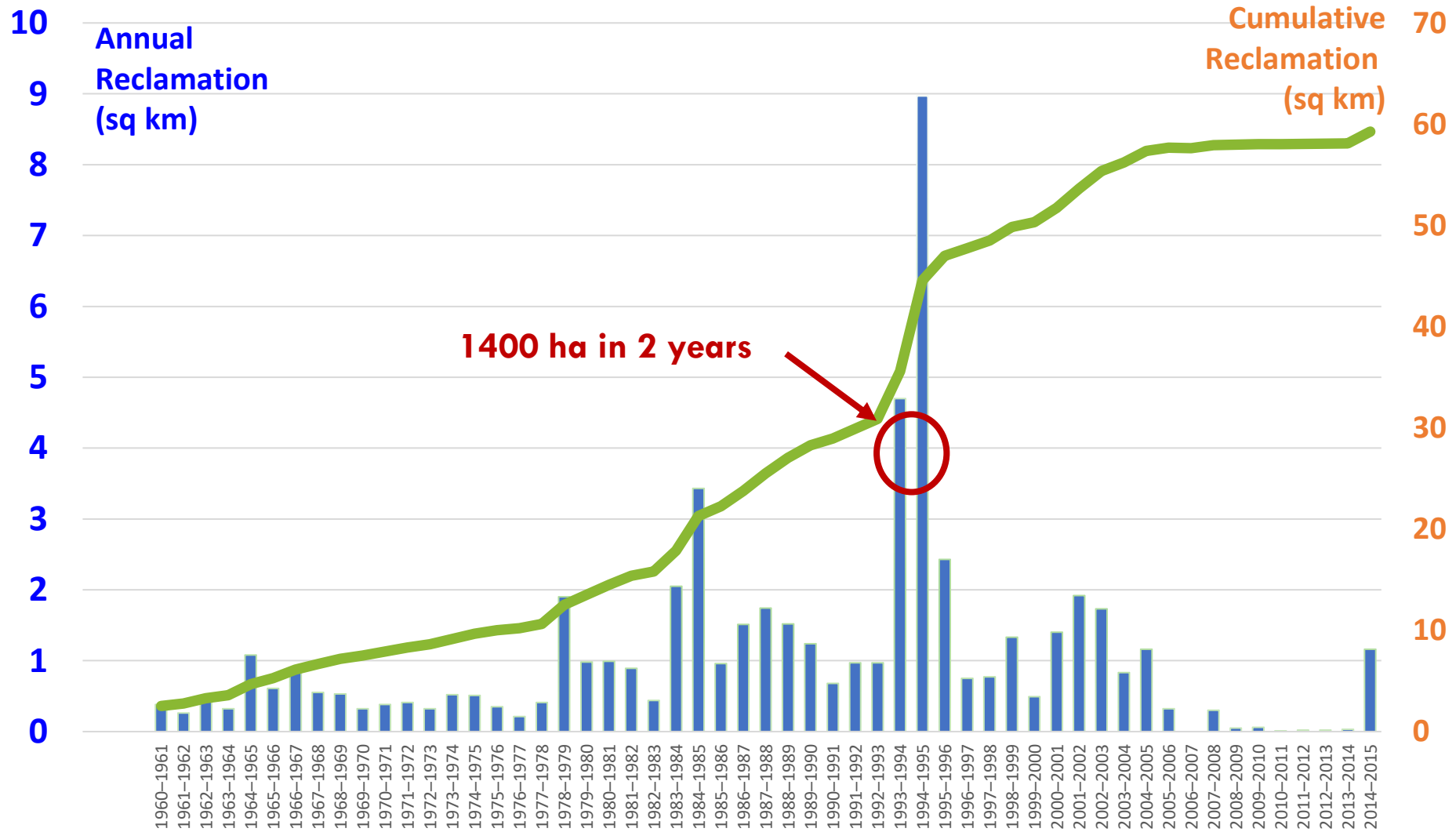


**1953 Xmas Fire**



**1954 Shek Kip Mei Estate**

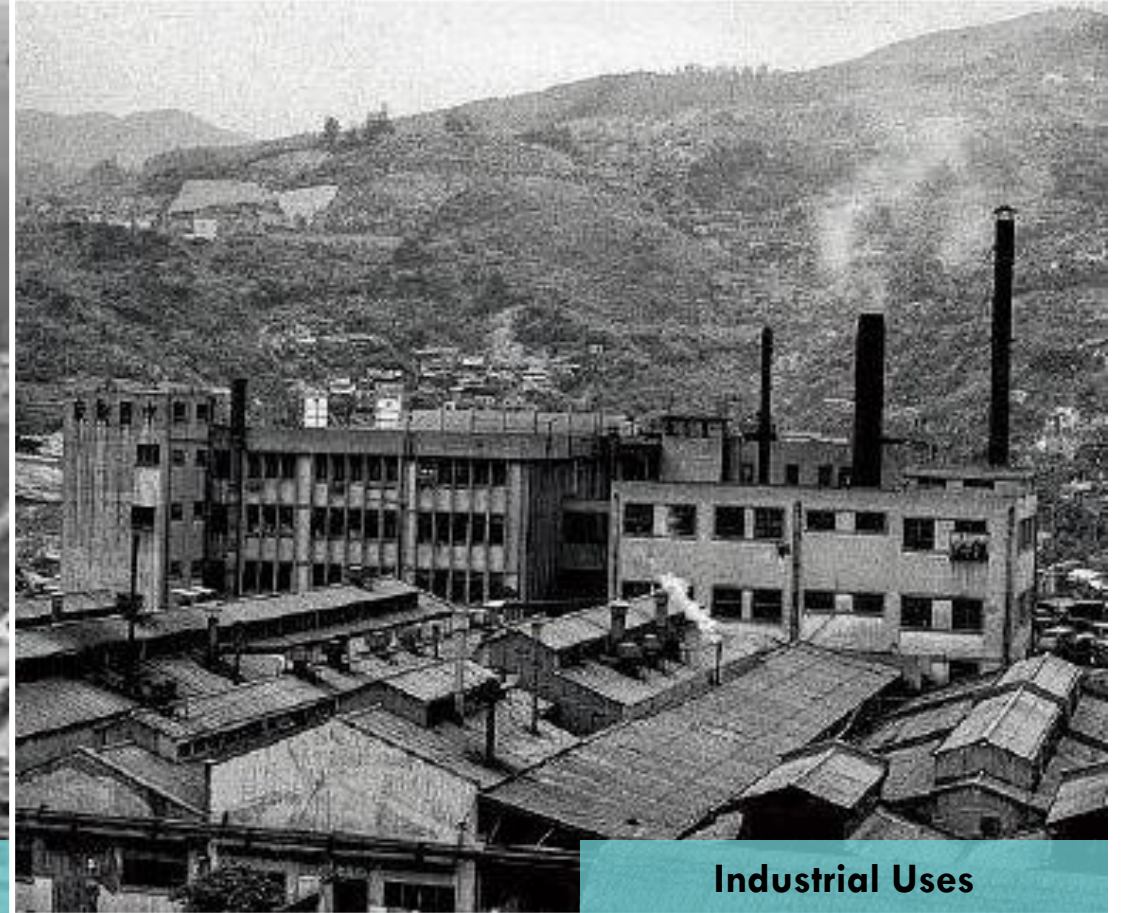
# LAND DEVELOPMENT & RECLAMATION



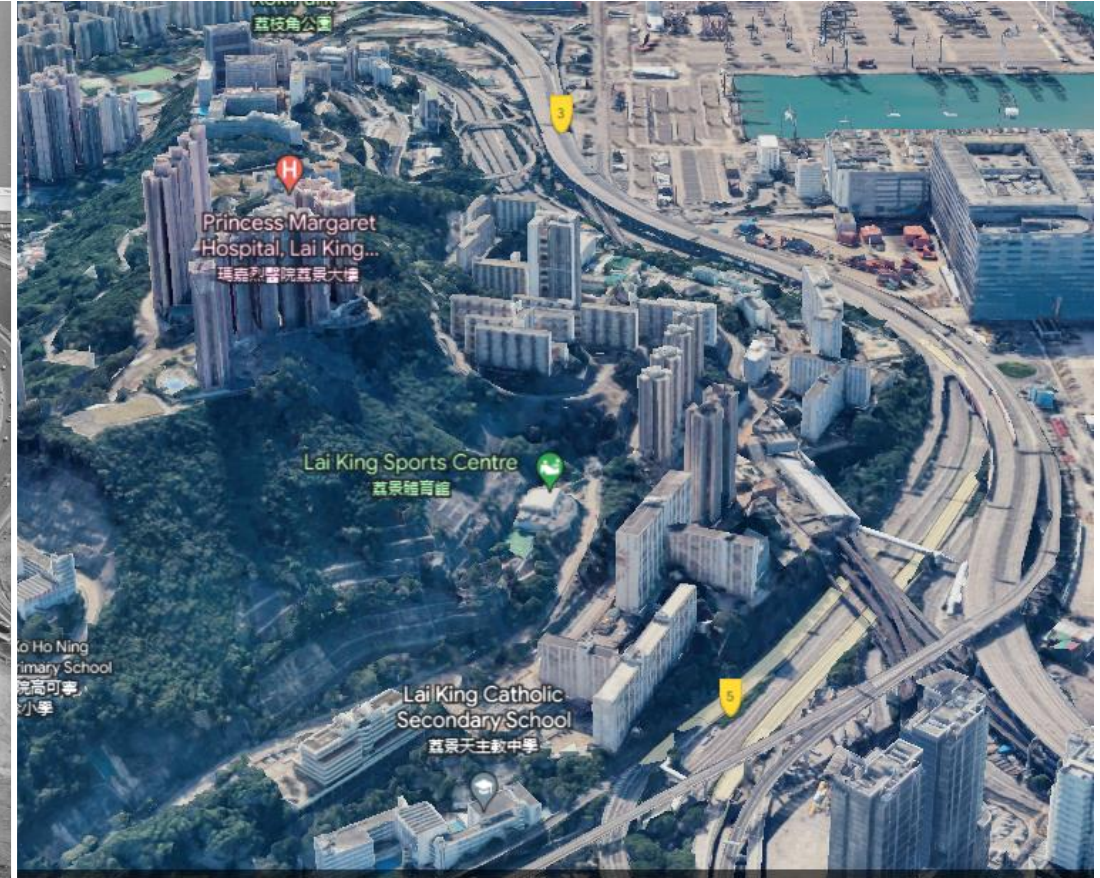
# SATELLITE TOWNS



# SATELLITE TOWNS



# FROM BORROWING TO RECLAMATION



# INDUSTRIES



# SOCIAL INSTABILITY

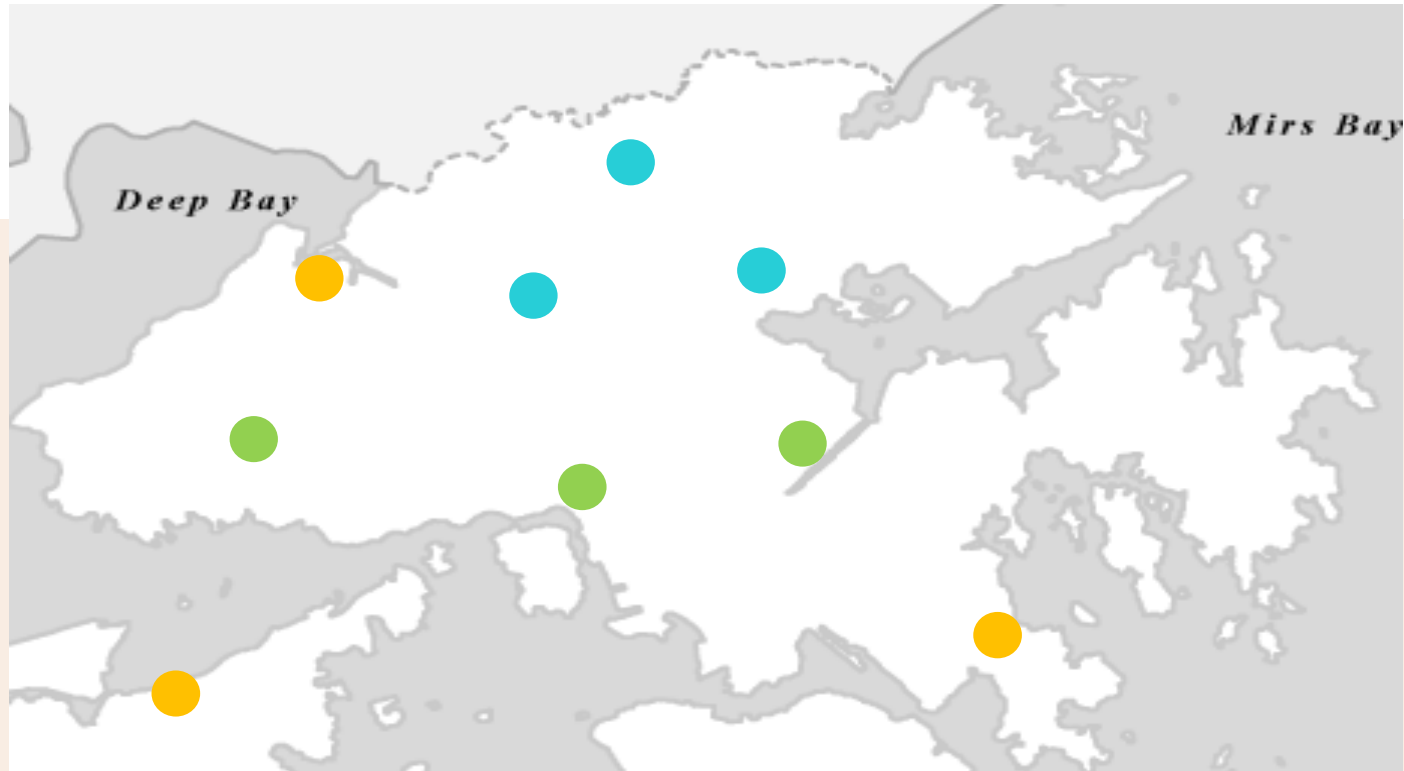


# 1970S TO NOW - THE ROAD TO A MODERN METROPOLIS

**Huge Invest –**  
Shifted from Water  
Supply to Land, Housing  
and Transportation...



# MODERN NEW TOWNS



**70's - 1<sup>st</sup> 10-Year Housing Programme; to house 1.8M Pop.**

**In last 4 decades, build 9 New Towns housing 3.5M Pop  
and provide Solution Space for Economic Growth**



**1<sup>st</sup> - Tsuen Wan, Shatin and Tuen Mun**



**2<sup>nd</sup> - Tai Po, Fanling & Sheung Shui**



**3<sup>rd</sup> - TKO, Tin Shui Wai & Tung Chung**

# SELF-SUSTAINING NEW TOWNS



# EVOLUTION OF AIRPORT



**Old Kai Tak Airport**

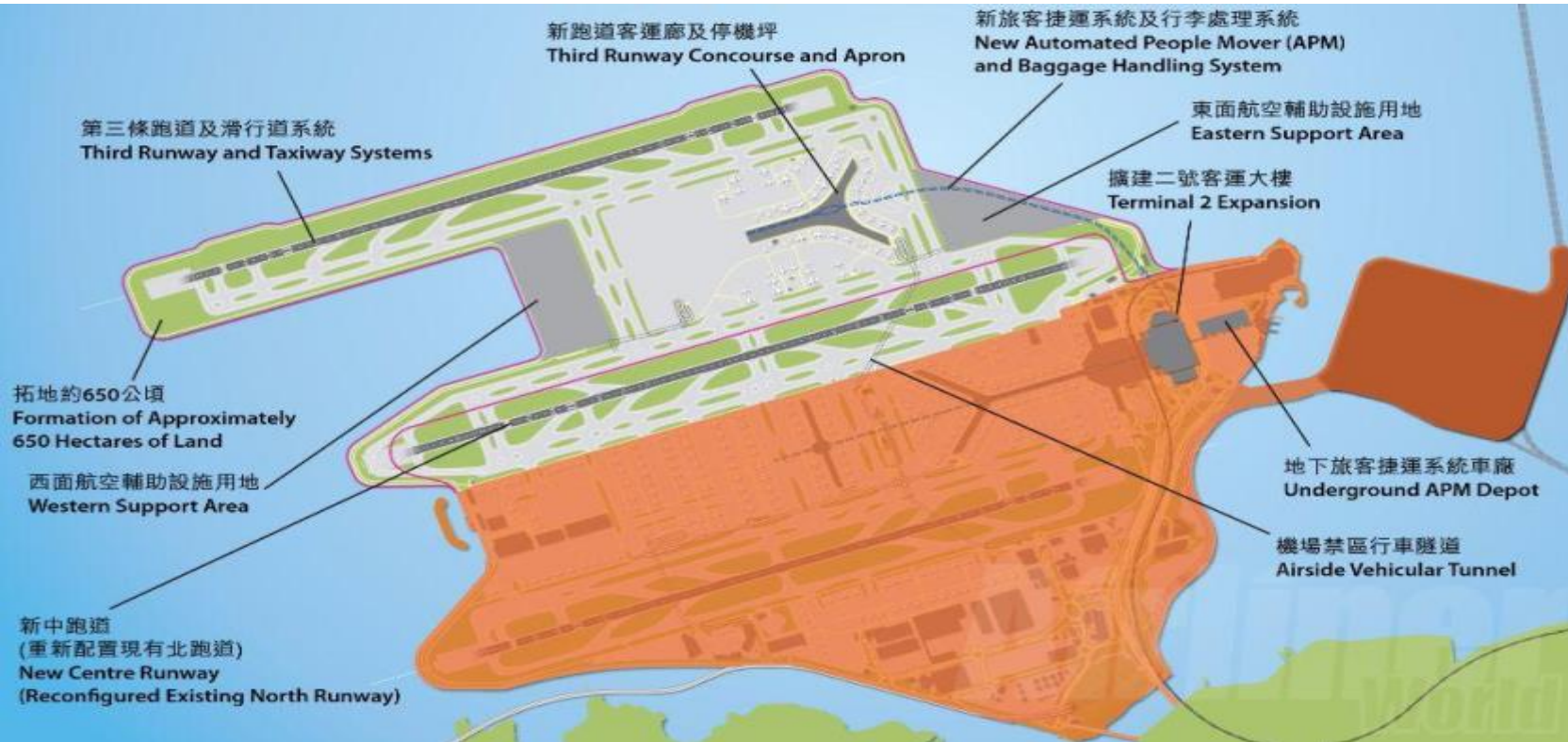
# MEGA TERMINAL FOR CLK AIRPORT



**Chek Lap Kok Airport**



# 3RS FOR CLK AIRPORT



3 Runway System



**High Speed Rail**



**Central – Wanchai Bypass**



**HK – Zhuhai – Macao Bridge**

# MODERN TRANSPORTATION PROJECTS

# OTHER LANDMARK FACILITIES



**Residential**



**Commercial**



**Utilities**



**Amenity**

# EVOLUTION OF HIGHWAYS AND RAILWAYS



# HIGHWAY (PRE- 1970S)



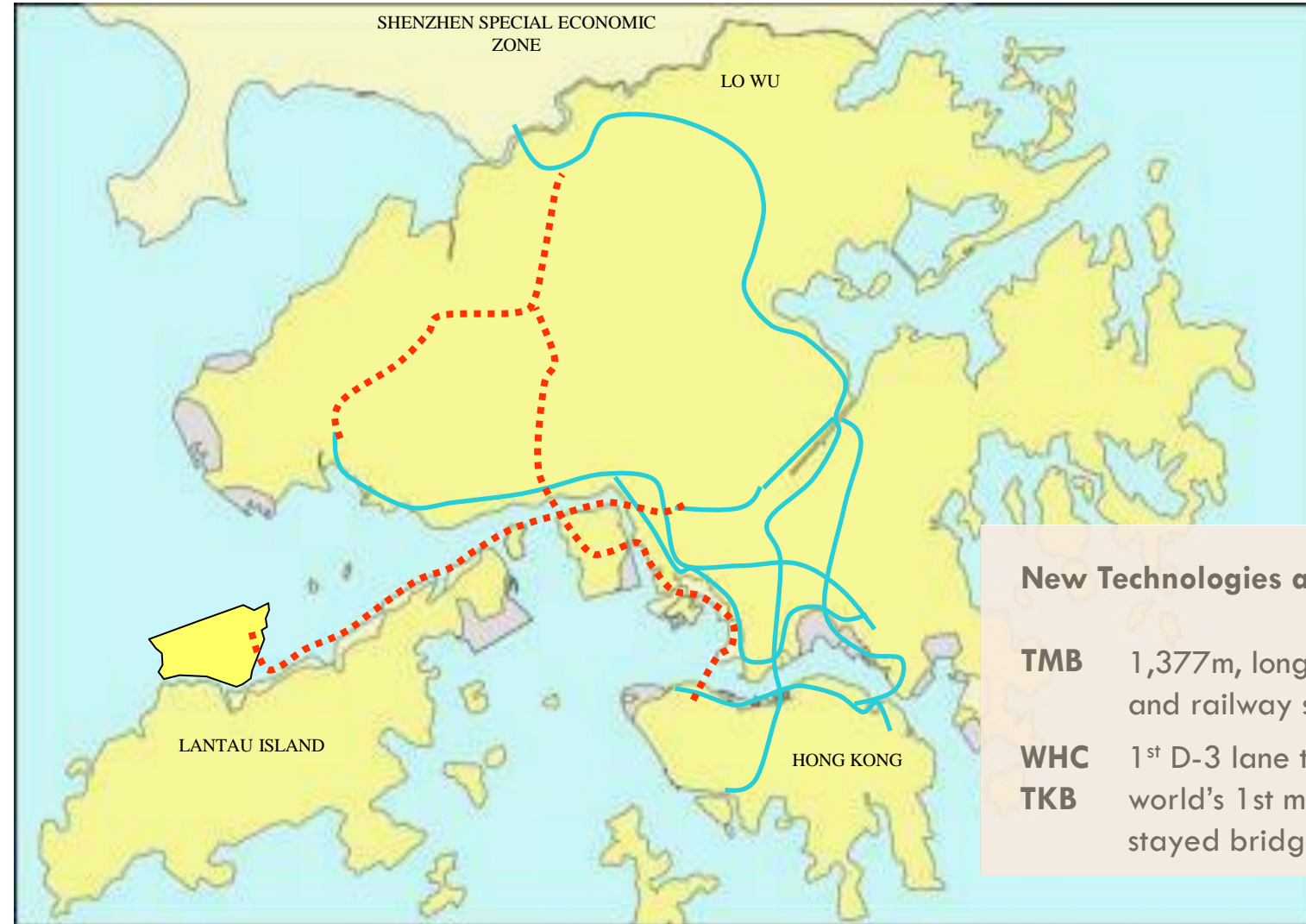
# HIGHWAY (1970S TO 1980S)



1<sup>st</sup> Tunnel in HK – LRT open in 1967

1<sup>st</sup> XHT open in 1972 and is also the 1<sup>st</sup> PPP infrastructure project

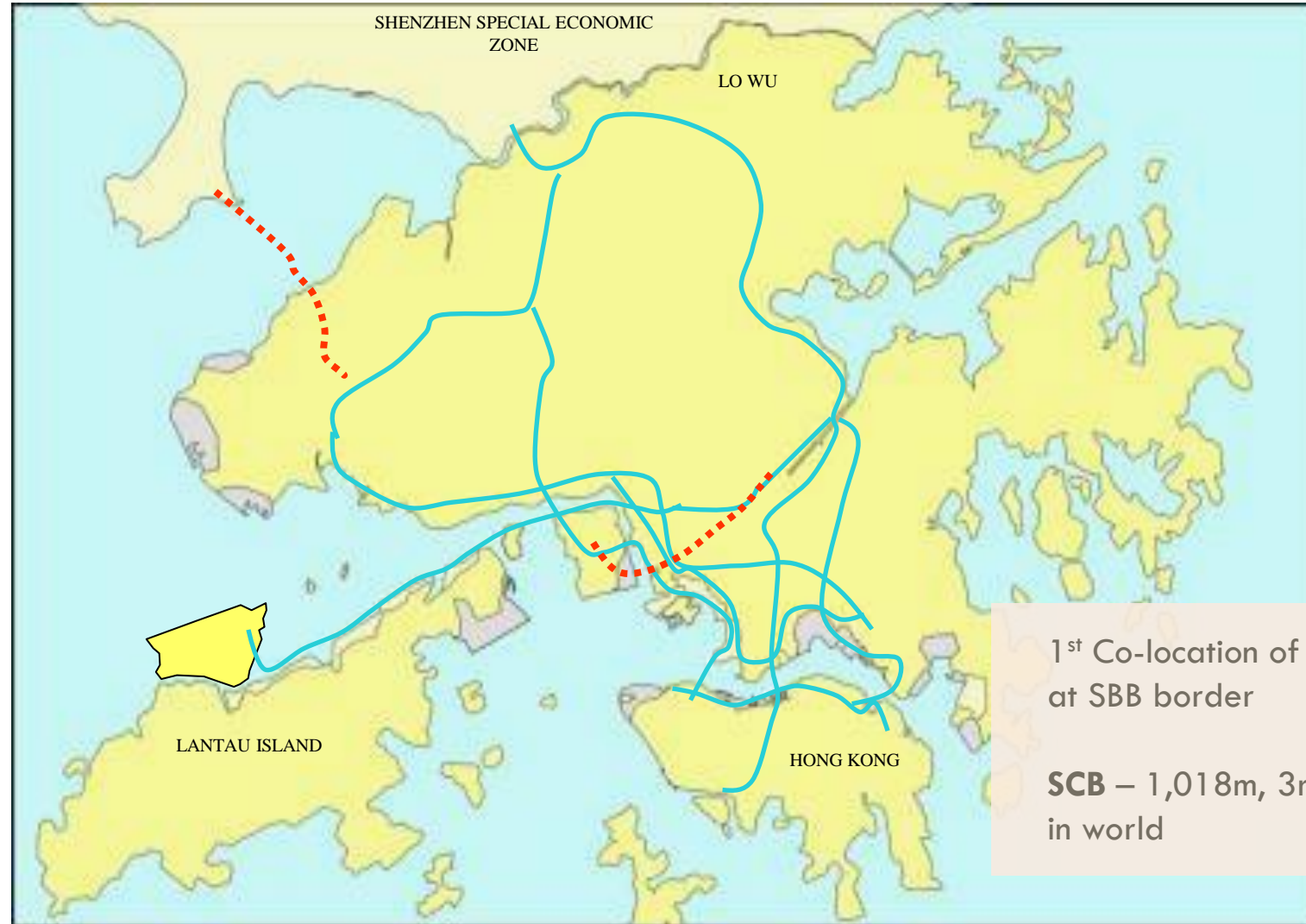
# HIGHWAY (1990S)



## New Technologies and Records

- TMB** 1,377m, longest combined road and railway suspension bridge
- WHC** 1<sup>st</sup> D-3 lane tunnel.
- TKB** world's 1<sup>st</sup> major 4-span cable-stayed bridge.

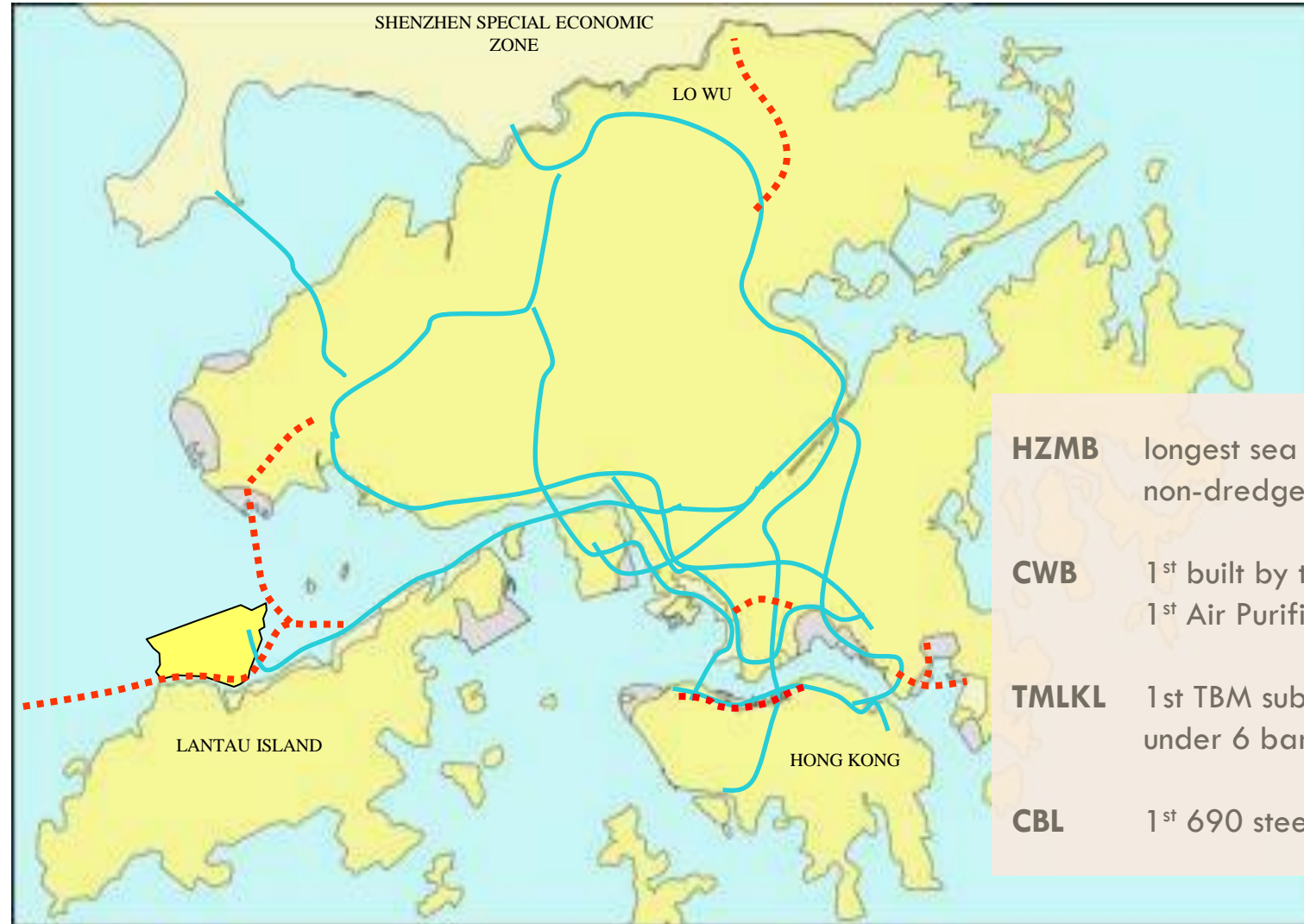
# HIGHWAY (2000S)



1<sup>st</sup> Co-location of CIQ in 2007  
at SBB border

**SCB** – 1,018m, 3<sup>rd</sup> longest CSB  
in world

# HIGHWAY (2010S TO NOW)



- HZMB** longest sea crossing. 1<sup>st</sup> fully non-dredge reclamation in HK
- CWB** 1<sup>st</sup> built by temp reclamation. 1<sup>st</sup> Air Purification System
- TMLKL** 1<sup>st</sup> TBM subsea tunnel built under 6 bar. Largest dia 17.6m
- CBL** 1<sup>st</sup> 690 steel bridge in ∞ shape

# RAILWAY (PRE-1970S)

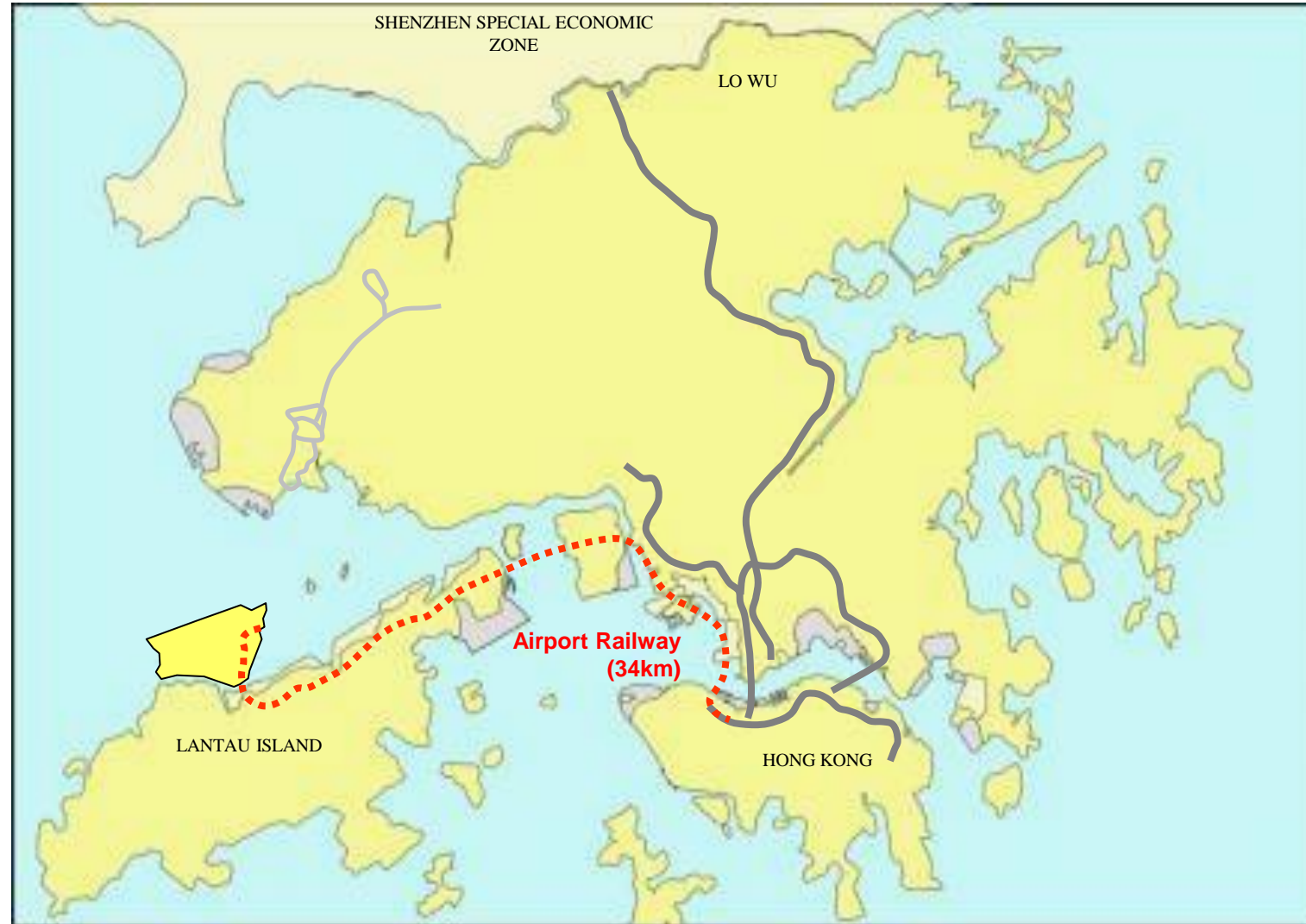


# RAILWAY (1970S – 1980S)

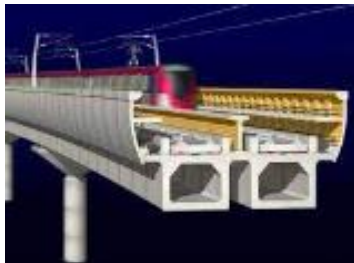


- KCR** double track and E-fied
- MTR** 1st open KTL in 1979. Using Railway + Property model to finance construction. Rank leader in urban mobility with 99.9% punctuality
- LRT** open in 1988

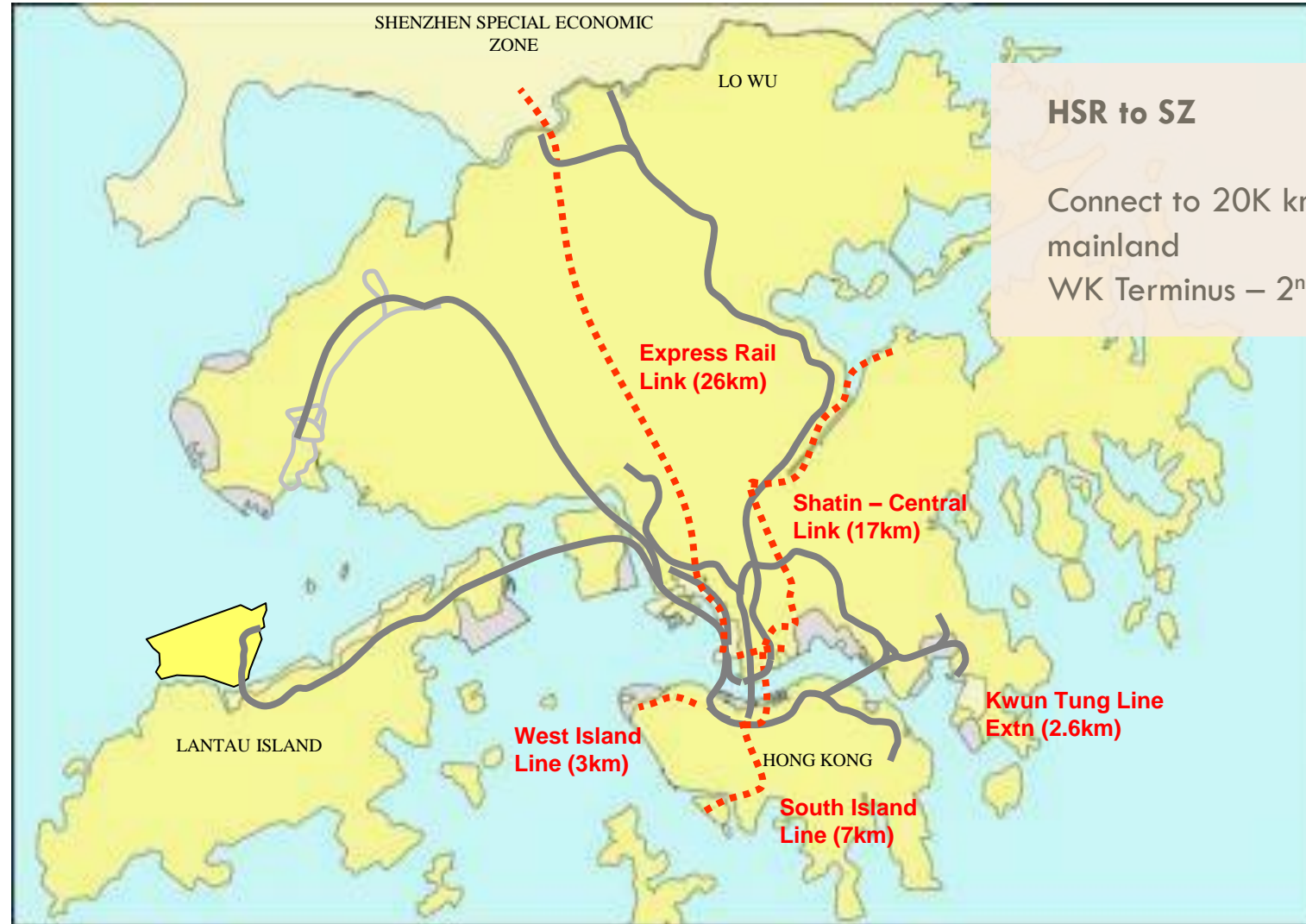
# RAILWAY (1990S)



# RAILWAY (2000S)



# RAILWAY (2010 TO NOW)



## HSR to SZ

Connect to 20K km HSR network in mainland

WK Terminus – 2<sup>nd</sup> Co-location CIQ

# FINANCIAL HUB



# EVOLUTION OF CENTRAL



# Asia's World Metropolis

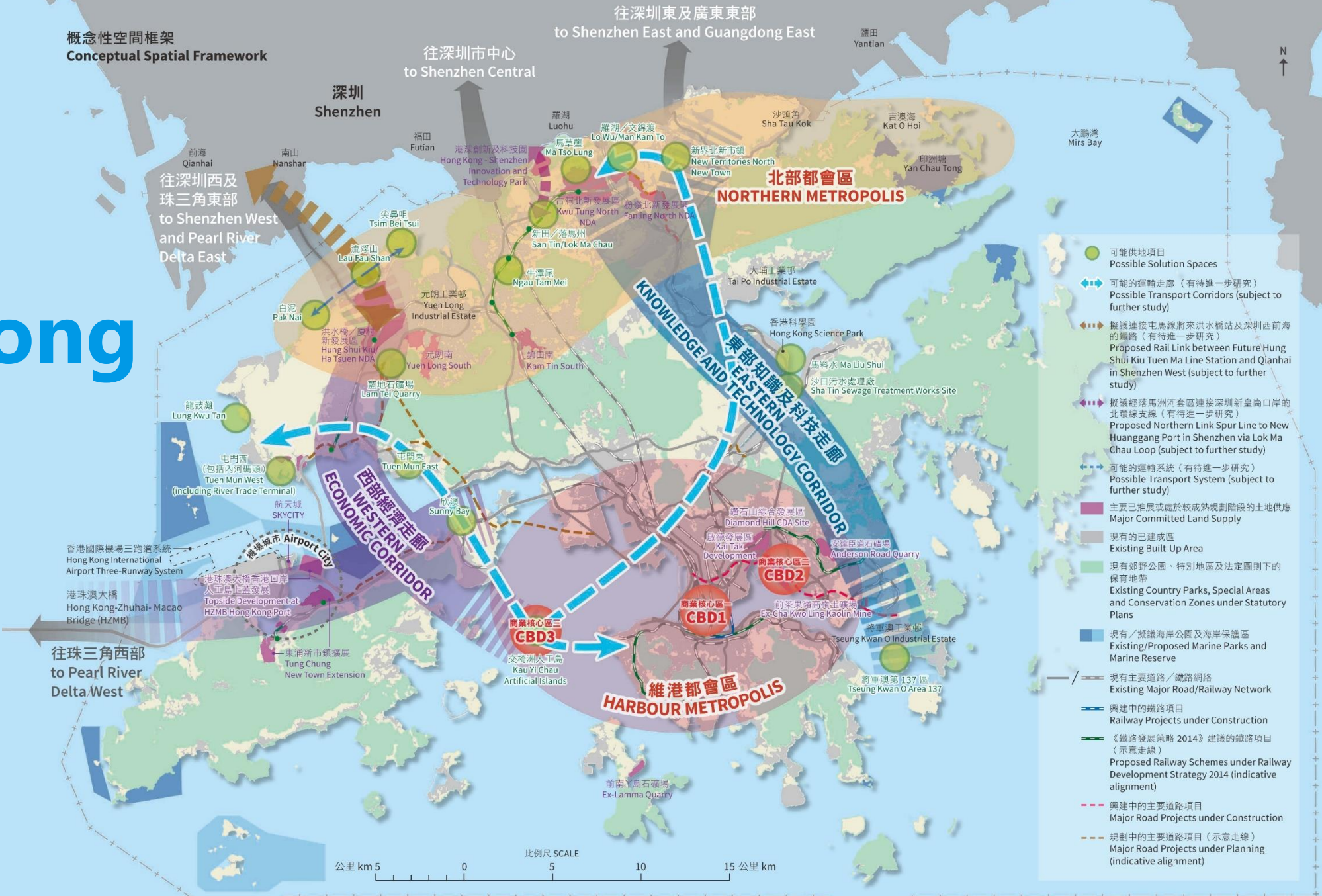


**FROM METROPOLIS TO  
GREENER, SMARTER  
AND HAPPIER**



# Hong Kong 2030+

概念性空間框架  
Conceptual Spatial Framework



- 可能供地項目  
Possible Solution Spaces
- ⇄ 可能的運輸走廊 (有待進一步研究)  
Possible Transport Corridors (subject to further study)
- ⇄ 擬議連接屯馬線將來洪水橋站及深圳西前海  
的鐵路 (有待進一步研究)  
Proposed Rail Link between Future Hung Shui Kiu Tuen Ma Line Station and Qianhai in Shenzhen West (subject to further study)
- ⇄ 擬議經落馬洲河套區連接深圳新皇崗口岸的  
北環線支線 (有待進一步研究)  
Proposed Northern Link Spur Line to New Huanggang Port in Shenzhen via Lok Ma Chau Loop (subject to further study)
- ⇄ 可能的運輸系統 (有待進一步研究)  
Possible Transport System (subject to further study)
- 主要已推展或處於成熟規劃階段的土地供應  
Major Committed Land Supply
- 現有的已建成區  
Existing Built-Up Area
- 現有郊野公園、特別地區及法定圖則下的  
保育地帶  
Existing Country Parks, Special Areas  
and Conservation Zones under Statutory  
Plans
- 現有/擬議海岸公園及海岸保護區  
Existing/Proposed Marine Parks and  
Marine Reserve
- 現有主要道路/鐵路網絡  
Existing Major Road/Railway Network
- 興建中的鐵路項目  
Railway Projects under Construction
- 《鐵路發展策略2014》建議的鐵路項目  
(示意走線)  
Proposed Railway Schemes under Railway  
Development Strategy 2014 (indicative  
alignment)
- 興建中的主要道路項目  
Major Road Projects under Construction
- 規劃中的主要道路項目 (示意走線)  
Major Road Projects under Planning  
(indicative alignment)

比例尺 SCALE  
公里 km 5 0 5 10 15 公里 km

# HONG KONG ROADMAP



Northern Metropolis



Harbour Metropolis



New Housing and  
Land Developments



New -industrialisation



Technology and  
Innovations hub

# COMMITTED PROJECTS



Kwu Tung North / Fanling North  
New Development Area



Lok Ma Chau Loop Development Area



Shek Wu Hui Effluent Polishing Plant



Relocation of Sha Tin Sewage Treatment  
Works to Caverns



Hung Shui Kiu / Ha Tsuen  
New Development Area



Three Runway System Project

**3rd Runway OPENED**



Tung Chung New Town Extension



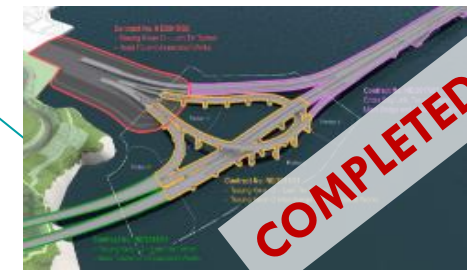
Central Kowloon Route



Kai Tak Development

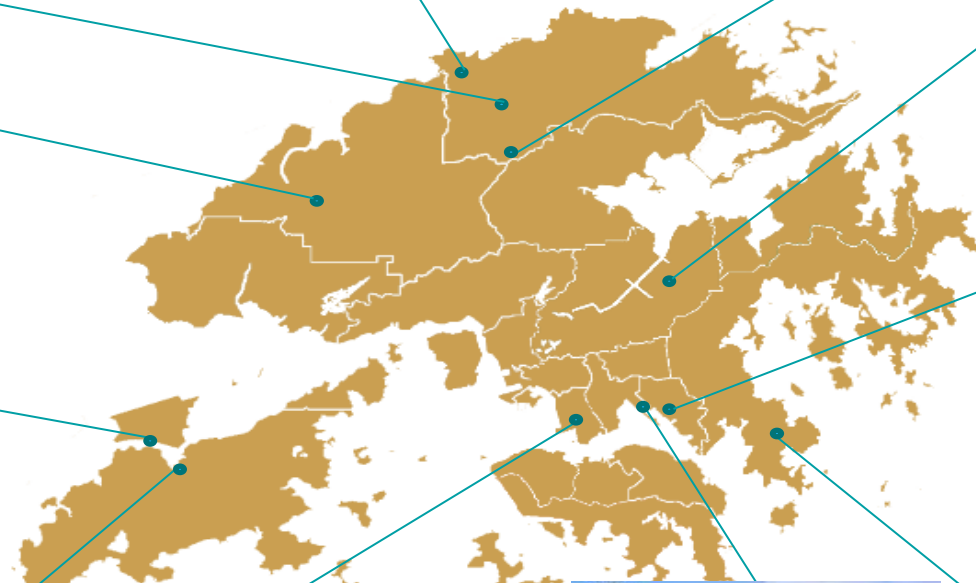


Trunk Road T2 and Cha Kwo Ling Tunnel



Tseung Kwan O - Lam Tin Tunnel

**COMPLETED**



# LAND



Tseung Kwan O Area 137



Northern Metropolis



Kau Yi Chau Artificial Islands

# LAND - KAU YI CHAU ARTIFICIAL ISLANDS

## Tentative Dates

Commence the Environmental Impact Assessment process in 2023  
Kick-start the reclamation works in 2025



## 2018 Policy Address

Launch the “Lantau Tomorrow Vision”

## 2022 Policy Address

The KYC Artificial Islands will expand the scope and capacity of HK’s development and greatly enhance HK’s competitiveness as a financial, commercial and trade centre.

## Development Potential

A new land of **1,000 hectares**

To build **150,000 to 260,000 housing units** to accommodate residential **population of around 400,000 to 700,000**

To create a work-live-play **CBD3** with **4M m<sup>2</sup> floor area** to bring about **200,000 job opportunities**



# BROAD LAND USE CONCEPTS

A blue-green network to promote healthy living and biodiversity; with 15-minute neighborhood concept



Regional park and water sports facilities



Blue-green corridor between living communities



Regional Park



Podium Green



Green Roof



Blue-green Infrastructure

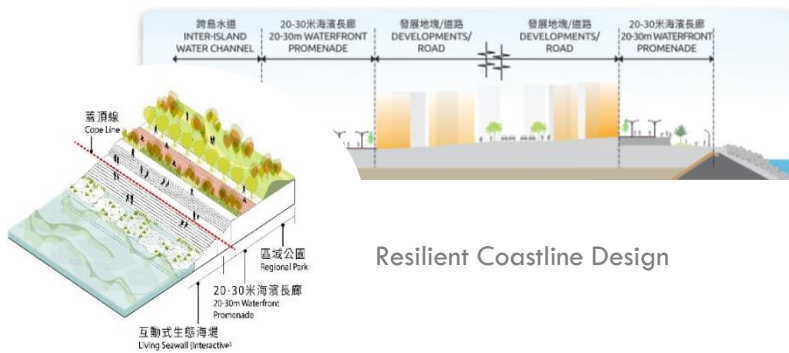


Pedestrianized Boulevard

# BROAD LAND USE CONCEPTS

Carbon-neutral exemplar –  
Smart, Green and Resilient City Strategy

## 1. Plan convenient and resilient land use layout

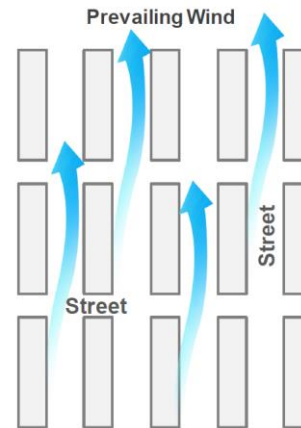


Resilient Coastline Design

## 2. Enhance environmental performance of buildings and encourage green buildings



Use MiC method to reduce carbon emissions



Consider prevailing wind directions and building orientations to reduce energy consumption

## 3. Promote urban forestry



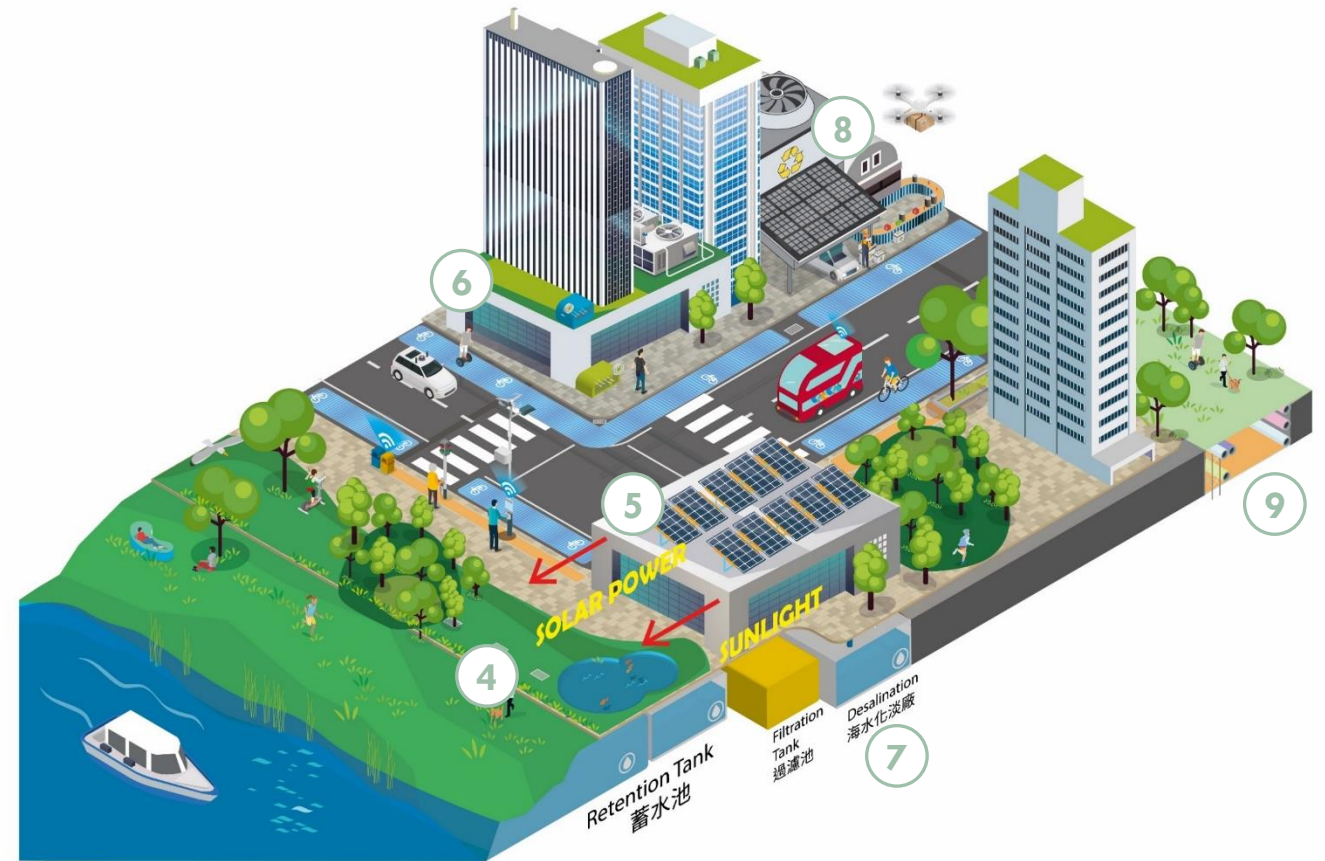
# A. Sustainable Planning and Urban Design

# BROAD LAND USE CONCEPTS

Carbon-neutral exemplar –  
Smart, Green and Resilient City Strategy

4. Adopt “Sponge City” design (including sustainable urban drainage system)
5. Use renewable energy
6. Adopt district cooling systems
7. Construct desalination plant
8. Construct food waste/sewage sludge anaerobic co-digestion facilities
9. Construct common utility tunnel

## B. Integrated SGR Infrastructure System



# BROAD LAND USE CONCEPTS

Carbon-neutral exemplar –  
Smart, Green and Resilient City Strategy

## C. Smart Mobility

10. Plan comprehensive pedestrian and cycle network
11. Provide supporting facilities for electric and other new energy vehicles



# LAND - NORTHERN METROPOLIS



Total land area of 30 000 ha

Cover Yuen Long District and North District, including Yuen Long, Tin Shui Wai, Fanling, Sheung Shui and various new development areas

With innovation & technology (I&T) industry as the economic engine

Emerge as a “New International I&T City”, integrating quality life, new economies, and culture and leisure



概念性空間框架  
Conceptual Spatial Framework

往深圳市中心  
to Shenzhen Central

往深圳東及廣東東部  
to Shenzhen East and Guangdong East

Lok Ma Chau Loop

Hung Shui Kiu / Ha Tsuen NDA

Yuen Long South Development

Kwu Tung North NDA

Fanling North NDA



公里 km 5 0 5 10 15 公里 km

- 興建中的鐵路項目  
Railway Projects under Construction
- 《鐵路發展策略2014》建議的鐵路項目 (示意走線)  
Proposed Railway Schemes under Railway Development Strategy 2014 (indicative alignment)
- 興建中的主要道路項目  
Major Road Projects under Construction
- 規劃中的主要道路項目 (示意走線)  
Major Road Projects under Planning (indicative alignment)



# KEY ACTION DIRECTIONS

(1) Constructing HK-SZ Western Rail Link (HSK-Qianhai) and Expanding HSK/HT NDA

## (2) Making of HK's Silicon Valley — San Tin Technopole

(3) Exploring Northern Link (NOL) Eastward Extension and Expanding Kwu Tung North NDA

(4) Developing Lo Wu/Man Kam To Comprehensive Development Node

(5) Implementing Proactive Conservation Policy to Create Environmental Capacity

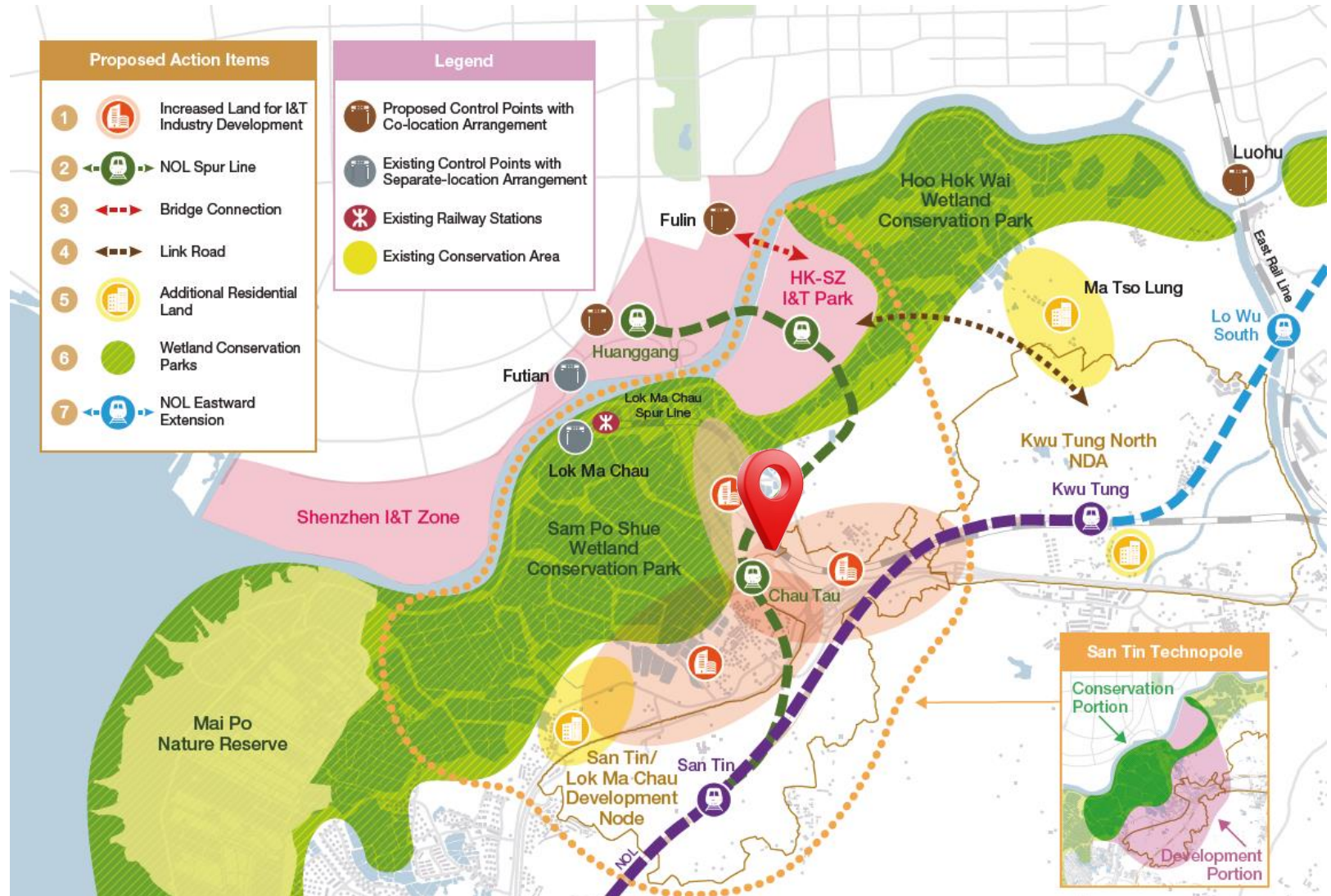
(6) Creating Outdoor Eco-recreation/ tourism Space with High Landscape Value

(7) Taking Proactive Steps to Redress Home-Job Imbalance

(8) Making of Sustainable Community Suitable for Living in and Working

(9) Re-engineering Administrative Mechanism and Operation Process

(10) Strengthening Radiation of HK with Comprehensive Footholds in Greater Bay Area



# KEY ACTION DIRECTIONS

## Chau Tau Areas



**Sam Po Shue  
Wetland  
Conservation  
Park**

**Pondside Park**

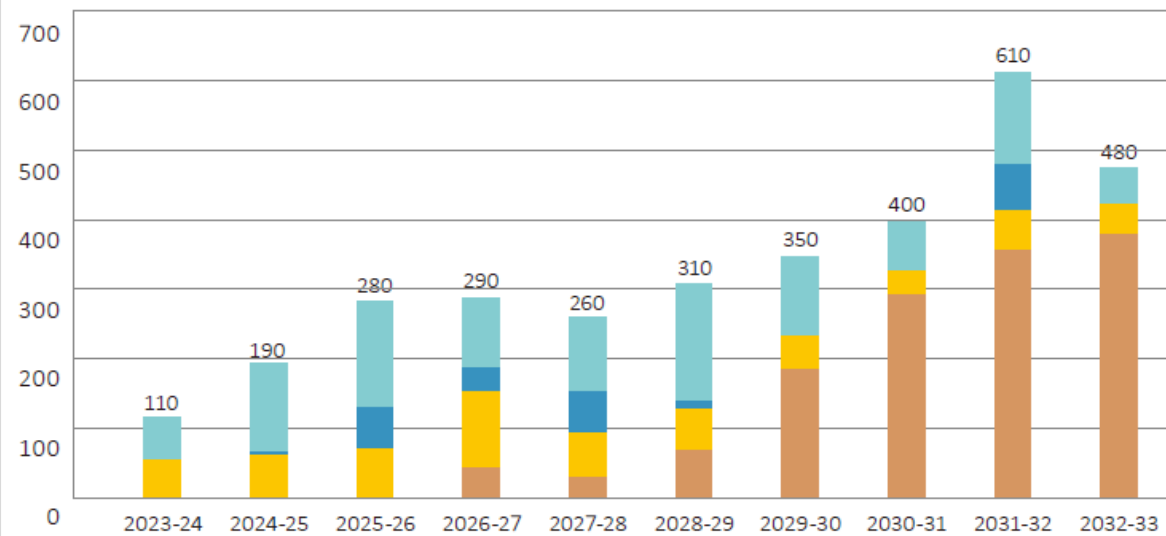
**Mixed Use (I&T Building and Office) /  
Residential Development  
(incl. Talent Apartments)**

**MTR Station /  
Station Square**

**Mixed Use (I&T Building  
and Office) /  
Residential  
Development  
(incl. Talent Apartments)**

# LAND – HOUSING SUPPLY

未來十年可供發展土地供應預測 (公頃)  
10-Year Supply Forecast of Developable Land (in ha)



| 主要土地來源<br>Major Sources of Land | TCNTE     | TCNTE     | TCNTE  | HSK/HT  | HSK/HT  | TKO 137   | KYC     | KYC       | KYC     | KYC       |
|---------------------------------|-----------|-----------|--------|---------|---------|-----------|---------|-----------|---------|-----------|
|                                 | 210 Sites | 210 Sites | HSK/HT | KTN/FLN | KTN/FLN | ST/LMC DN | TKO 137 | ST/LMC DN | LKT/TMW | ST/LMC DN |
|                                 |           |           |        |         |         |           |         |           | YLS     |           |

■ 具體用途正在研究的用地\*  
Land Use Under Study\*
 ■ 房屋用地  
Housing Land
 ■ 經濟用地  
Economic Land
 ■ 政府、機構或社區用地、休憩用地及道路基建  
Government, Institution or Community (G/IC) Land, Open Space and Road Infrastructure

\* 房屋用地／經濟用地／政府、機構或社區用地、休憩用地及道路基建的分佈尚未訂定。  
The split among housing land, economic land and G/IC land, open space and road infrastructure to be determined after study.

Supply of developable land will reach **3,280 ha** and show an **upward trend**

from **110 ha** in the first year to some **480 ha** in 2032-33

# HOUSING – 10-YR PLAN

301,000 public housing units



129,000 private housing units



**Total Housing Supply Target: 430,000 units**

**PRIORITY**



# HOUSING — ENHANCING QUANTITY, SPEED, EFFICIENCY AND QUALITY

- ✓ New Light Public Housing: **30,000 units** to be built in the coming five years (from 2023-24 to 2027-28)
- ✓ Overall public housing production: increase ~**50%** in the coming five years
- ✓ Get ready land supporting **≥ 72,000 residential units** in total for disposal through land sales or railway property developments in the coming five years



# TRANSPORT — 3 MAJOR ROADS & 3 RAILWAYS

## Policy Address 2022 - Three New Railways

1. Hong Kong - Shenzhen Western Rail Link
2. Central Rail Link
3. Tseung Kwan O Line Southern Extension

## Policy Address 2022 - Three New Roads

1. Northern Metropolis Highway
2. Shatin Bypass
3. Tseung Kwan O - Yau Tong Tunnel

Bring a highly inter-connected and accessible road network and rail system, and vigorously drive and support future development of Hong Kong



# TRANSPORT — 3 MAJOR ROADS & 3 RAILWAYS



## ----- Road infrastructures under planning

- Route 11
- Tsing Yi-Lantau Link
- Tuen Mun Bypass
- Improvements work of Lion Rock Tunnel

## ----- Railways under planning

- Tung Chung Line Extension, Oyster Bay Station and Tuen Mun South Extension
- Railway for the Kau Yi Chau Artificial Islands
- Science Park/Pak Shek Kok Station of the East Rail Line
- Northern Link

# HOSPITALS

## HK\$470 billion for Two Ten-year Hospital Development Plans (HDP)

### First Ten-year HDP:

- **6 500+** additional beds
- **94** additional operating theatres
- Additional annual capacity:  
**438 800** general outpatient clinic attendances  
**2 857 800** specialist outpatient clinic attendances

### Second Ten-year HDP:

- **9 000+** additional beds



### Chinese Medicine

**Chinese Medicine Hospital:**  
commence service in phases  
from Q2 2025

**Government Chinese Medicines  
Testing Institute:**  
complete construction in 2025



The Chinese medicine hospital is located in Wan Po Road, Tseung Kwan O

# INNOVATION & TECHNOLOGY BLUEPRINT

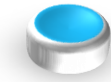
## Four Major Development Directions

- ✓ Enhance the I&T ecosystem and achieve new-industrialisation in HK
- ✓ Enlarge the I&T talent pool to create strong impetus for growth
- ✓ Develop HK into a smart city to improve the quality of life of our people
- ✓ Proactively integrate into the overall development of the country and consolidate HK's advantages as an international city

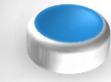
# INFRASTRUCTURE FOR I&T



InnoParks



Hong Kong-Shenzhen I&T Park & San Tin Technopole in the Northern Metropolis

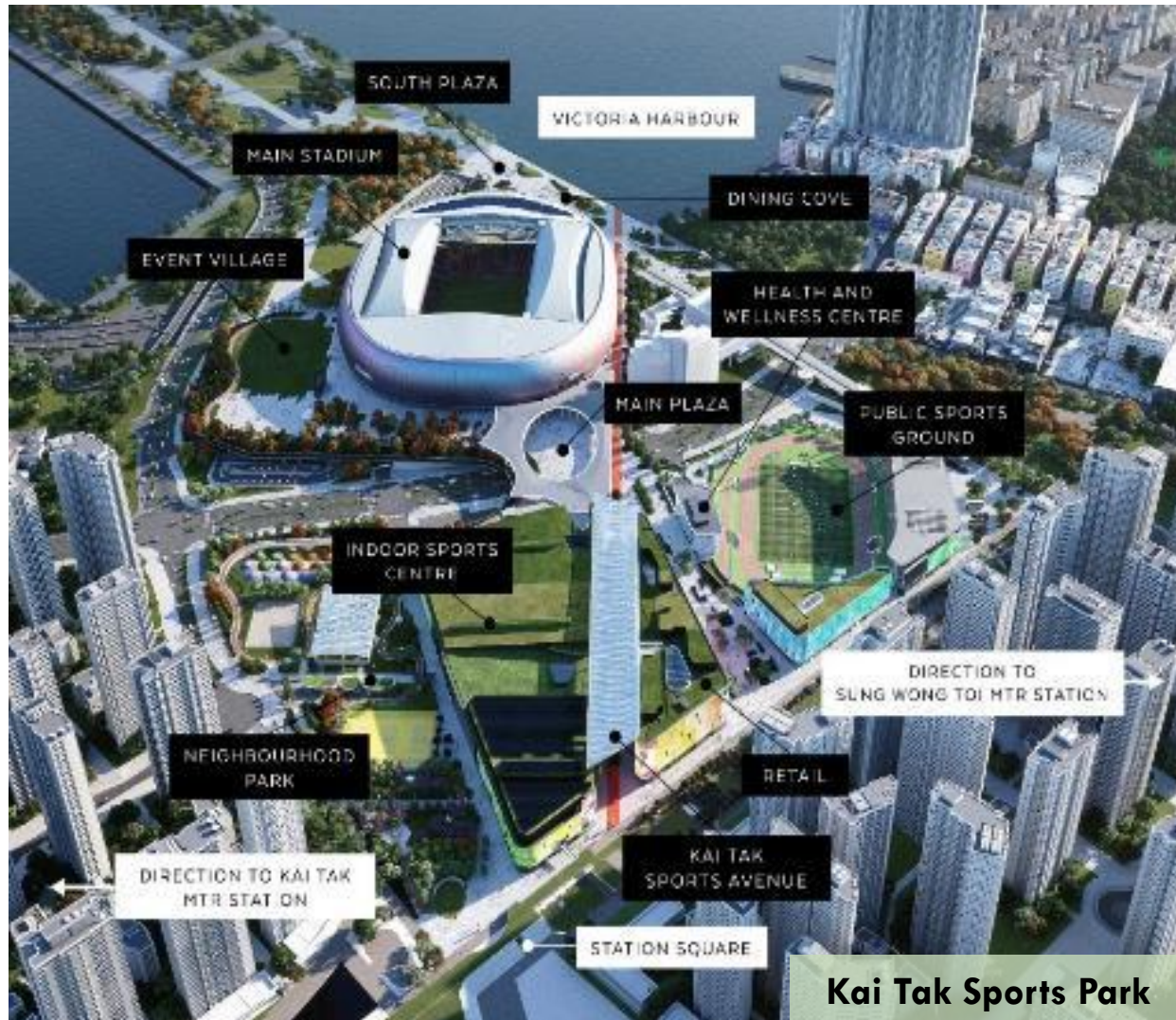


Phase 2 of the Science Park Expansion Programme & Eastern I&T Corridor



Cyberport 5 Expansion Project

# RECREATION AND LEISURE



# BEAUTIFY HARBOURFRONT



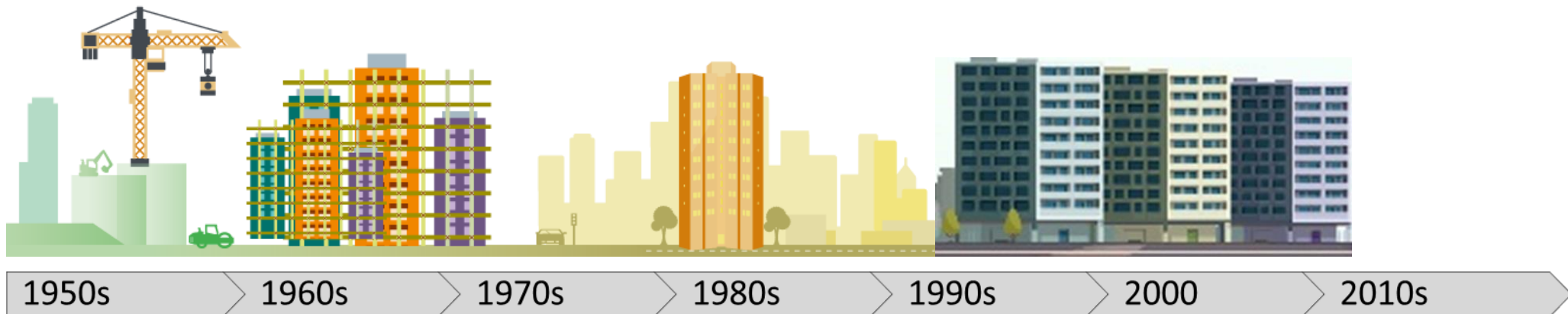
# BEAUTIFY HARBOURFRONT





# FROM BARREN ROCK TO METROPOLIS; TO GREENER, SMARTER & HAPPIER

## Who are the Key Players?



# FROM BARREN ROCK TO METROPOLIS; TO GREENER, SMARTER & HAPPIER

✓ Engineering is closely related to our daily lives

✓ Engineers create

**Large scale construction projects**  
railways, bridges, roads

**Innovative technologies**  
virtual reality (VR), smart robots, driverless cars

**Products design**  
ordinary pen

✓ Engineers play essential role in improving quality of lives with new technologies

## 21 DISCIPLINES OF ENGINEERS!



\*Photo courtesy : Cross Bay Link, Tseung Kwan O

# TYPES OF ENGINEERING

建造 Building

屋宇裝備  
Building Services

土木  
Civil

環境  
Environmental

消防  
Fire

岩土  
Geotechnical

材料  
Materials

結構  
Structural

航空  
Aircraft

電機  
Electrical

燃氣及能源  
Gas & Energy

物流及運輸  
Logistics &  
Transportation

製造、工業及系統  
Manufacturing,  
Industrial & Systems

機械、輪機、造船及化工  
Mechanical, Marine, Naval  
Architecture & Chemical

核子  
Nuclear

生物醫學  
Biomedical

控制、自動化及  
儀器儀表  
Control, Automation &  
Instrumentation

電子  
Electronics

資訊科技  
Information  
Technology

# FROM BARREN ROCK TO METROPOLIS; TO GREENER, SMARTER & HAPPIER

工程師的工作正是城市進步和人類文明發展的核心

是多元化、多彩多姿、充滿挑戰、成功感，同市民生活息息相關

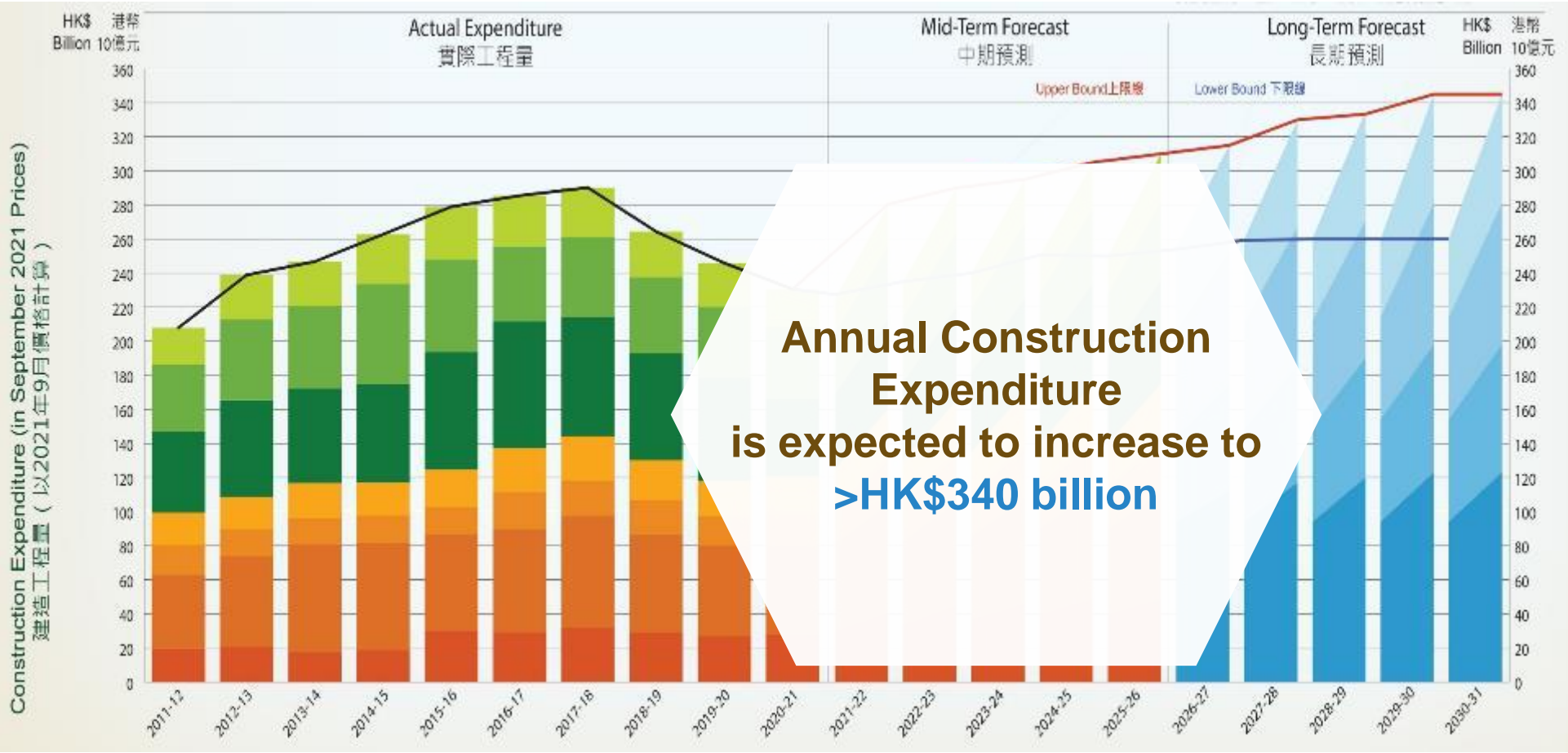
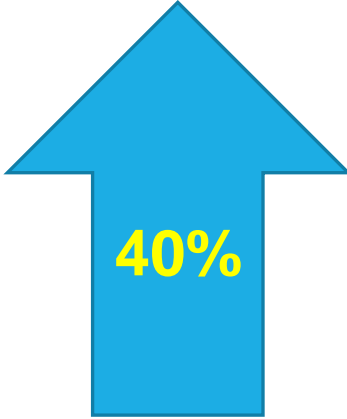
**Engineer's** work is right at the heart of cities advancement and development of human civilization

It is diversified, vibrant, full of challenges and satisfaction; closely connected with people's daily living



# OVERALL CONSTRUCTION EXPENDITURES

Construction Expenditure Forecast for  
Public and Private Sectors (Updated In  
May 2022)



**Actual Expenditure & Mid-Term**  
實際工程量及中期預測

|                         | Public Sector<br>公營界別 | Private Sector<br>私營界別 |
|-------------------------|-----------------------|------------------------|
| E&M Works*<br>機電工程*     | Orange                | Light Green            |
| RMAA Works*<br>裝修及維修工程* | Dark Green            | Light Green            |
| Civil Works<br>土木工程     | Dark Orange           | —                      |
| Building Works<br>建造工程  | Red                   | Dark Green             |

**Long-Term  
長期預測**

|      | Public Sector<br>公營界別 | Private Sector<br>私營界別 |
|------|-----------------------|------------------------|
| Blue | Blue                  | Blue                   |

\*E&M Works - 電力及機械工程  
\*E&M Works - Electrical and Mechanical Works  
\*裝修及維修工程 - 維修、保養、改建及加建工程  
\*RMAA Works - Repair, Maintenance, Alteration and Additional Works

# TALENT

## Part B: Forecasted Mismatch – Professionals

| Discipline                           | 2023                               | 2024                               | 2025                               | 2026                               | 2027                               |
|--------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Architect                            | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| BIM Manager                          | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Mild shortage (5% and less)        | Mild shortage (5% and less)        | Mild shortage (5% and less)        |
| Building Surveyor                    | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      |
| Civil Engineer                       | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| Construction Manager / Site Engineer | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| Electrical / Mechanical Engineer     | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| Environmental Engineer               | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| Geotechnical Engineer                | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) |
| Land Surveyor                        | Mild shortage (5% and less)        | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Mild shortage (5% and less)        |
| Landscape Architect                  | Moderate shortage (6% to 15%)      | Mild shortage (5% and less)        | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      |
| Structural Engineer                  | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) | Considerable shortage (16% to 25%) | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      |
| Town Planner                         | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      |
| Quantity Surveyor                    | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Moderate shortage (6% to 15%)      | Considerable shortage (16% to 25%) |

**CIC “Manpower Forecast for HK Construction Industry”**

**A shortage of 6000~6400 professionals**

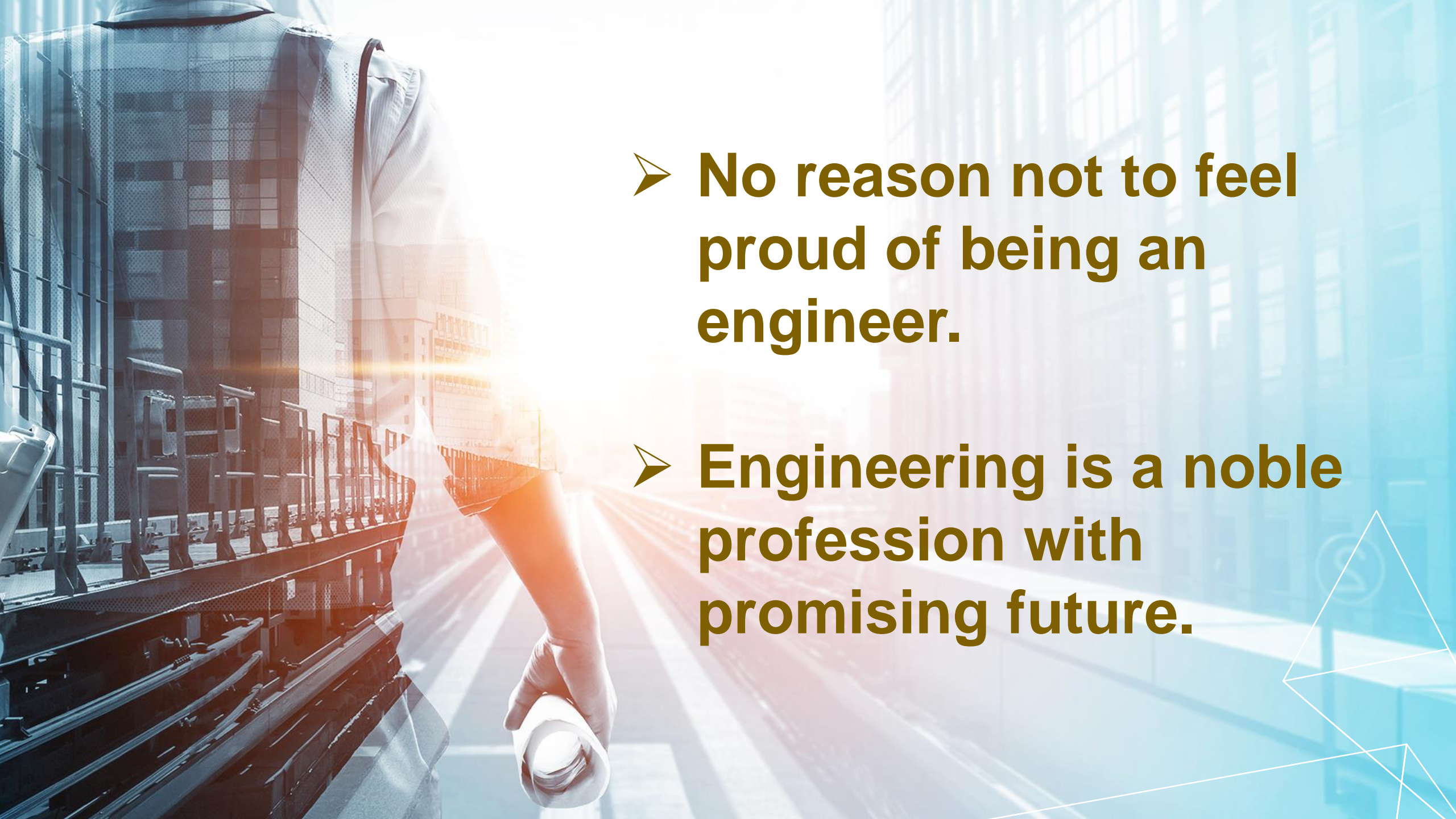
|                                    |                                    |
|------------------------------------|------------------------------------|
| Stable trend, no shortage expected | Considerable shortage (16% to 25%) |
| Mild shortage (5% and less)        | Serious shortage (25% and more)    |
| Moderate shortage (6% to 15%)      |                                    |



**HKIE - Time to Change**  
Commitment to Change -  
Boosting Professionalism  
香港工程師學會 - 專業維新


**WE ARE  
PROUD  
TO BE  
ENGINEERS**

以工程師為傲

- 
- **No reason not to feel proud of being an engineer.**
  - **Engineering is a noble profession with promising future.**

- **Deliver our Services to the Community Professionally with Heart and Diligence**
  - **Tell Good Engineering Stories**
  - **Nurture Talented Successors**

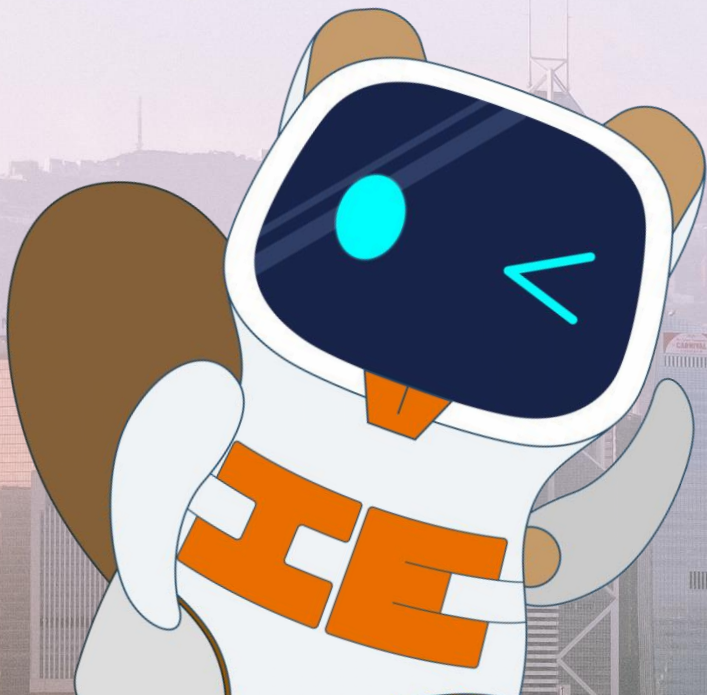





HONG KONG IS  
PROUD  
OF YOU, ENGINEERS !!

香港  
以有工程師為傲



# THANK YOU




🔍 HKIE 🗣️

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# ACKNOWLEDGEMENTS

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# SUPPLEMENTARY INFORMATION



**Aircraft**



**Biomedical**

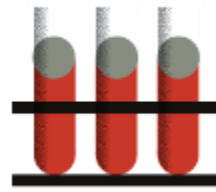


**Building**





## Building Services



## Chemical



## Civil





## Control, Automation & Instrumentation



## Electrical



## Electronics





## Energy



## Environmental



## Fire





## Gas



## Geotechnical



## Information





## Logistics & Transportation

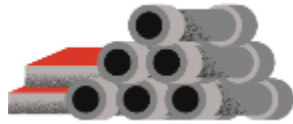


## Manufacturing, Industrial & System

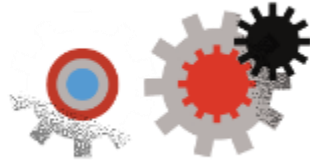


## Marine & Naval Architecture





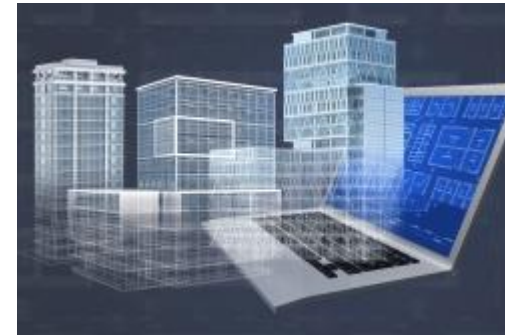
## Materials



## Mechanical



## Structural



# Imagine, the future can be...



**Marine & Naval  
Architecture**



**Aircraft**



**Civil**



**Mechanical**



# Imagine, the future can be...

  
**Logistics &  
Transportation**



  
**Biomedical**



  
**Control,  
Automation &  
Instrumentation**



  
**Information**



# Imagine, the future can be...

  
**Logistics &  
Transportation**



  
**Biomedical**



  
**Control,  
Automation &  
Instrumentation**



  
**Information**

