

# Delivering Cost Effective Public Works Projects through Cost-based Procurement



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Development Bureau, HKSAR Government



# Your Contributions

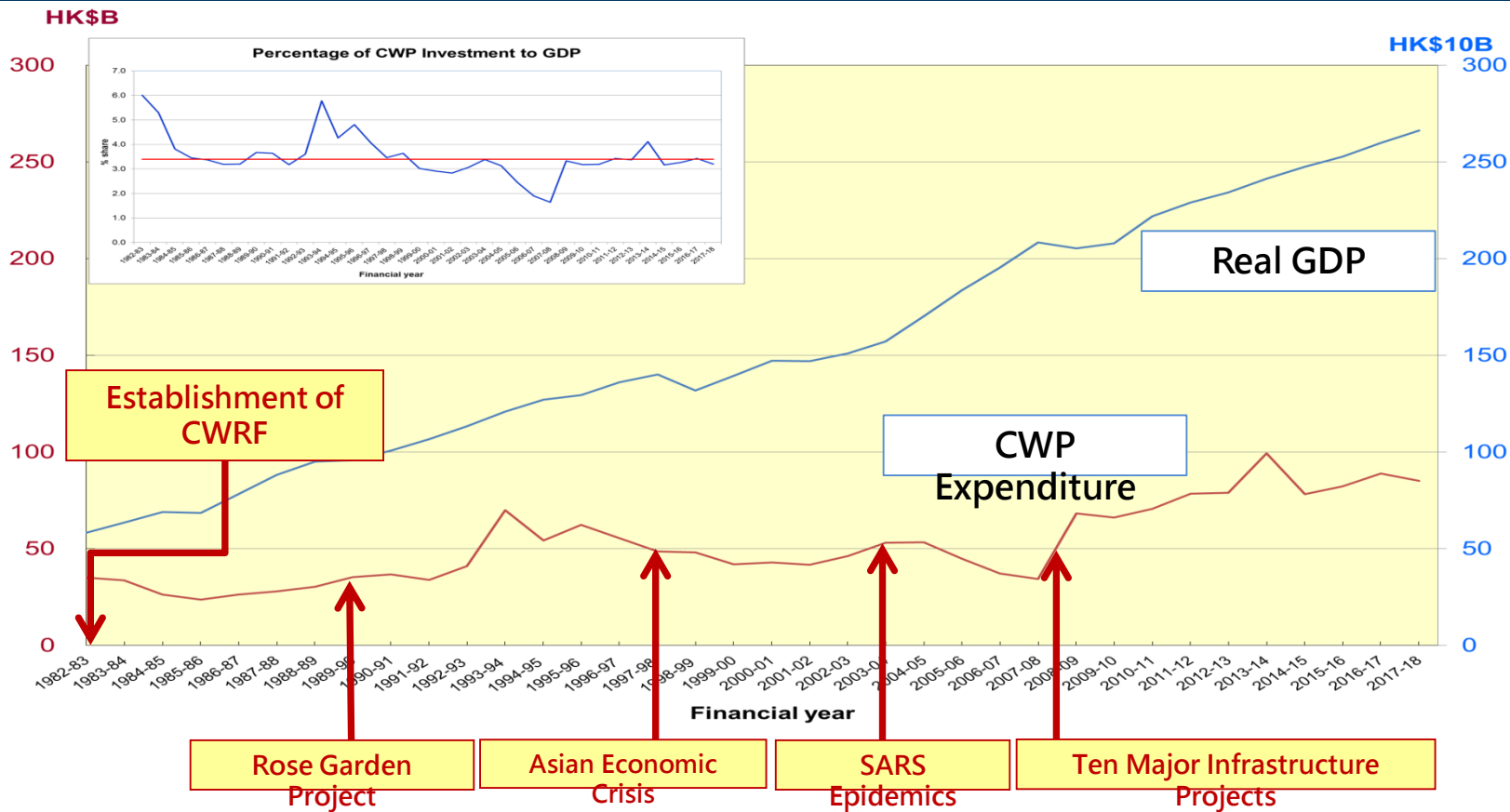
## Construction Industry

is TASKED to ...

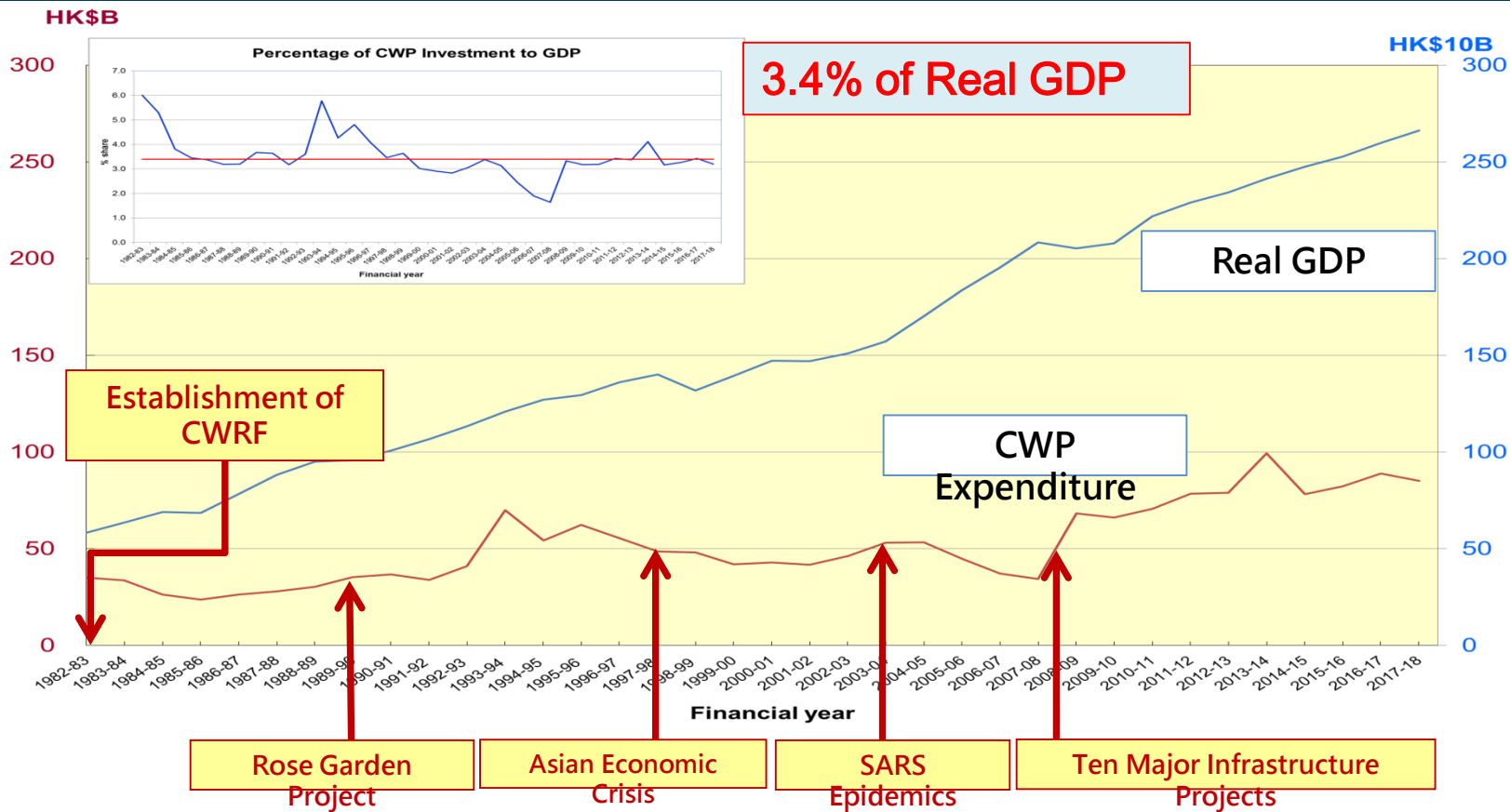
- Improve people's living environment
- Promote economic growth
- Enhance Hong Kong's long term competitiveness \*



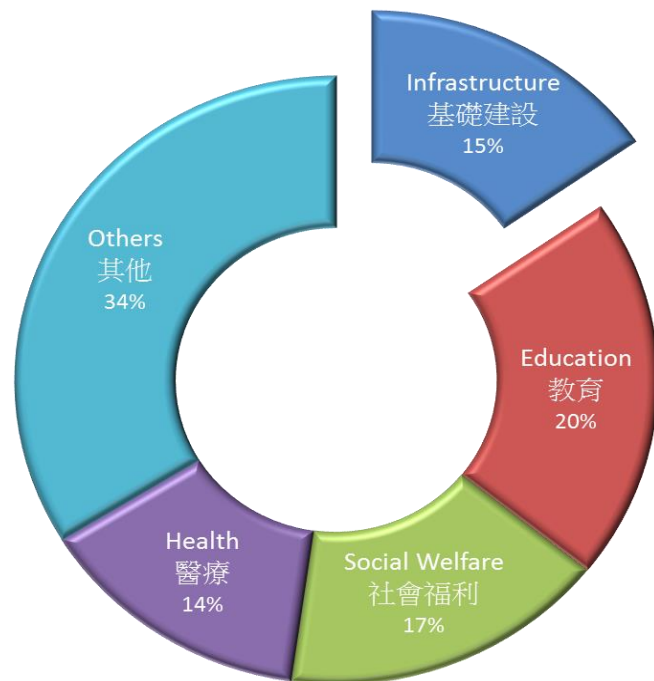
# How much should be allocated for public works?



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# Considerable Investment in Infrastructure



## 2018-19 Budget

2018-19 GDP	\$2,800B
Govt. Revenue	\$605B
Govt. Expenditure	\$558B
Infrastructure	\$86B



**Infrastructure to GDP:  
3.2%**





# Construction Industry in Hong Kong

## Challenges



# Core challenges facing the industry



**Significant future construction volumes**



**High costs**



Unsatisfactory mega-project performance



Unsatisfactory site safety performance

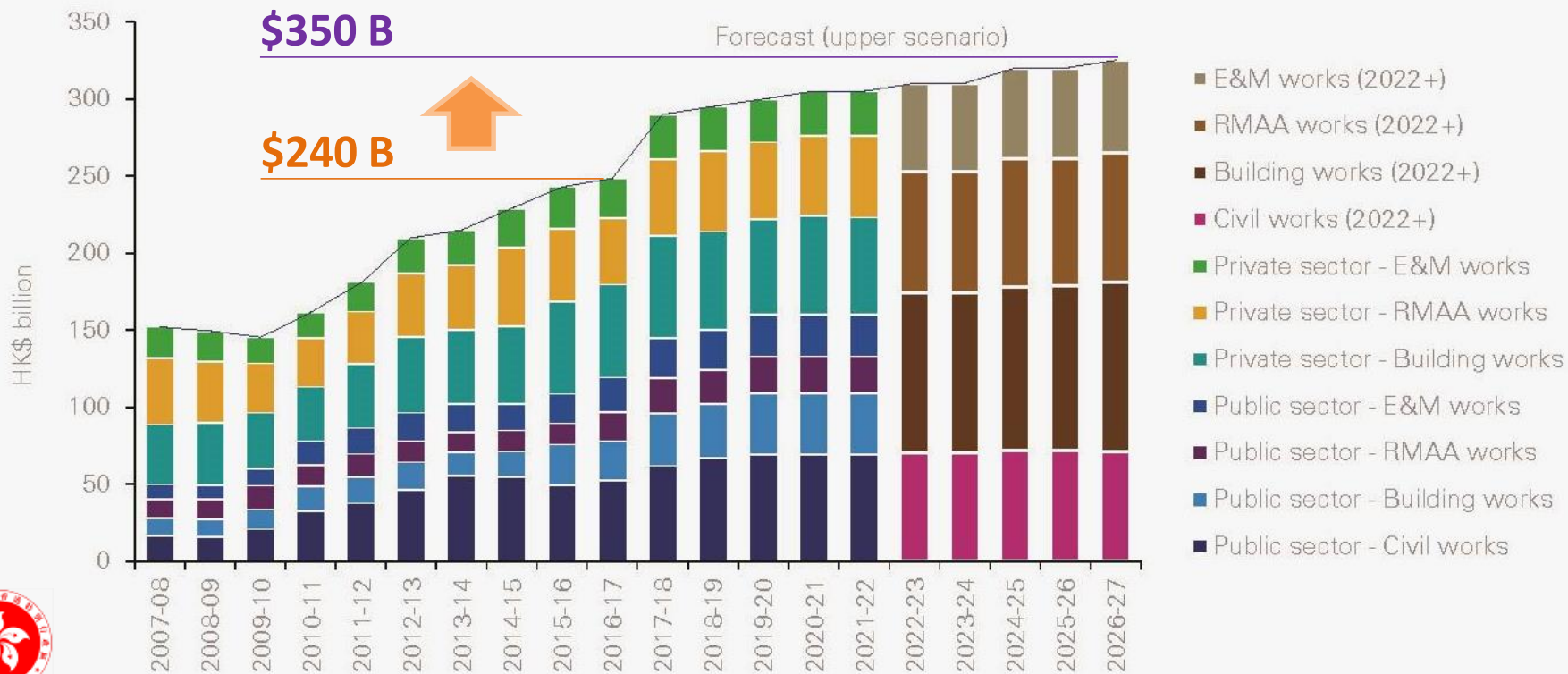


Declining productivity



Lack of creativity and innovation

# Significant future construction volume





# Major projects in the pipeline

- Housing and land supply ( Lantau, NDA )
- Transportation ( 3rd Runway )
- Health care (Hospital Development Plan)
- Education (Hostel Development Fund)
- Sports and recreation facilities (5-Yr Plan)
- Other livelihood-related projects

## Overall Expenditure

➤ **\$1,000B** in next 10 years!  
i.e. > \$100B @ year



# Core challenges facing the industry



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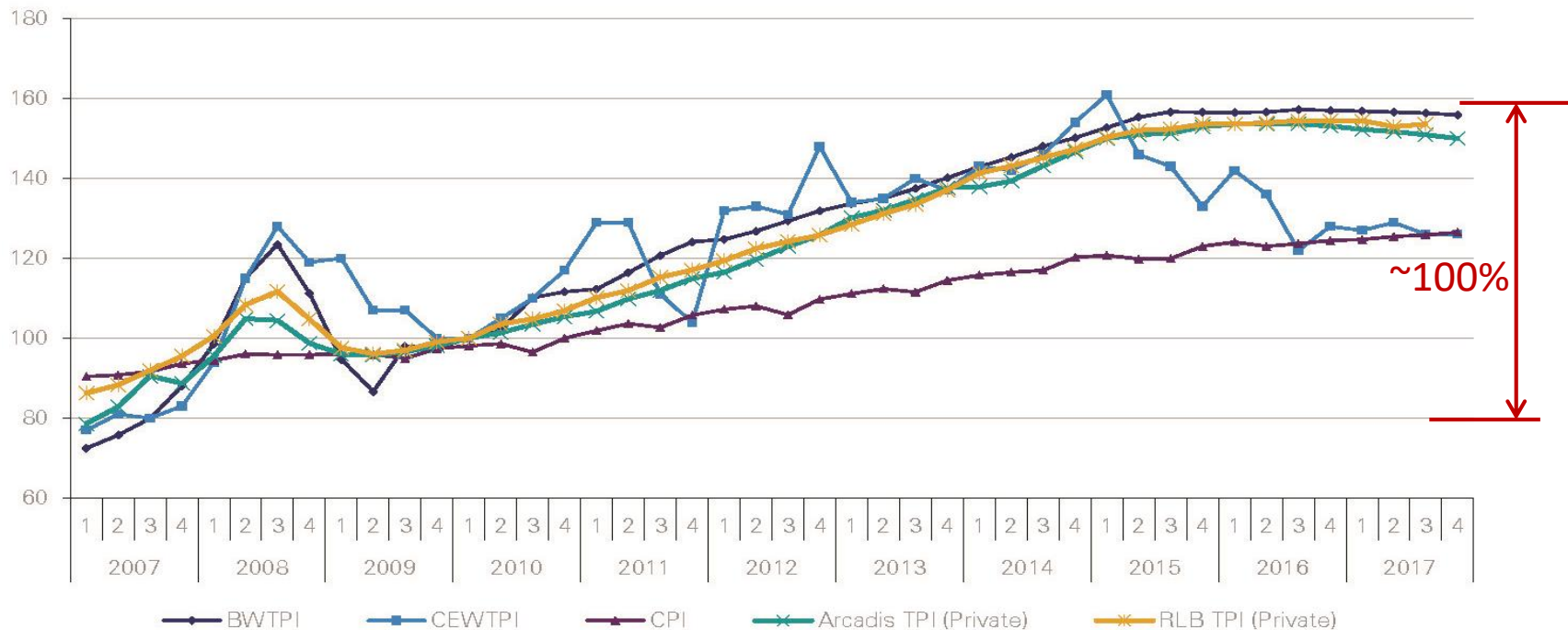
# High construction cost

Ranking	Arcadis International Construction Costs 2018 <sup>12</sup>	Turner & Townsend International Construction market survey 2018 <sup>13</sup>
1	New York City	San Francisco
2	San Francisco	New York City
3	Hong Kong	Hong Kong
4	Zurich	Toronto
5	London	Boston

**Hong Kong -**  
**3<sup>rd</sup> most expensive place to build!**



# Tender Price Indices



Source: Architectural Services Department, Civil Engineering and Development Department, Arcadis, Rider Levett Bucknall, Census and Statistics Department

# Our pathway

## Important industry milestones

Airport  
Core Programme

1998

Construction  
Industry  
Review  
Committee

2001

Construction  
costs  
taking off

2009

Project Cost  
Management  
Office

2016

Building challenges  
in  
Public housing

1999-  
2000

Ten Major  
Infrastructure  
Projects

2007

Financial Secretary  
TF on Managing  
Cost of Public Works

2015

2018



# Project Cost Management Office (PCMO)

- Established PCMO in June 2016
- Direct command of Perm Secretary for Development (Works)
- Report to the Financial Secretary regularly
- Oversee cost management for all public works projects
- Promote cost management in private sector projects



# Project Cost Management Office (PCMO)

- Objectives:

- Contain risks of budget overrun
- Ensure cost-effectiveness of public works projects

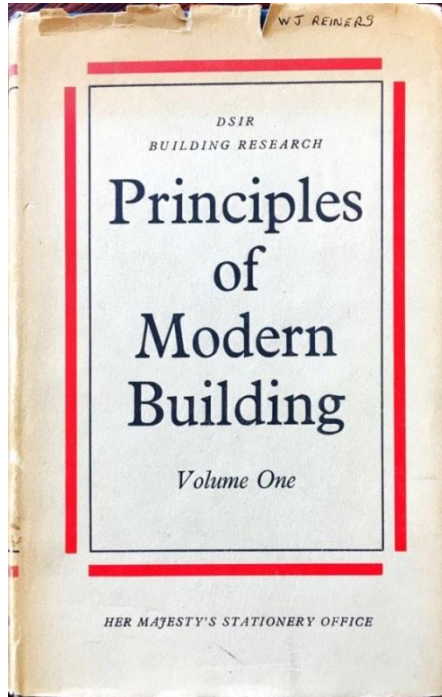
- Achievements:

- Cost saving of \$27 billion or ~10% (out of \$260 billion in 130 projects)
- Increasing cost awareness in Project Offices



# Why do we need to pay so much?

## *Conventional Wisdom*



The designer is often content to leave the matter entirely to the contractor, and while the latter will undoubtedly overcome the problems imposed by the design, this often means that the cost is higher than it need be.



# Why do we need to pay so much!

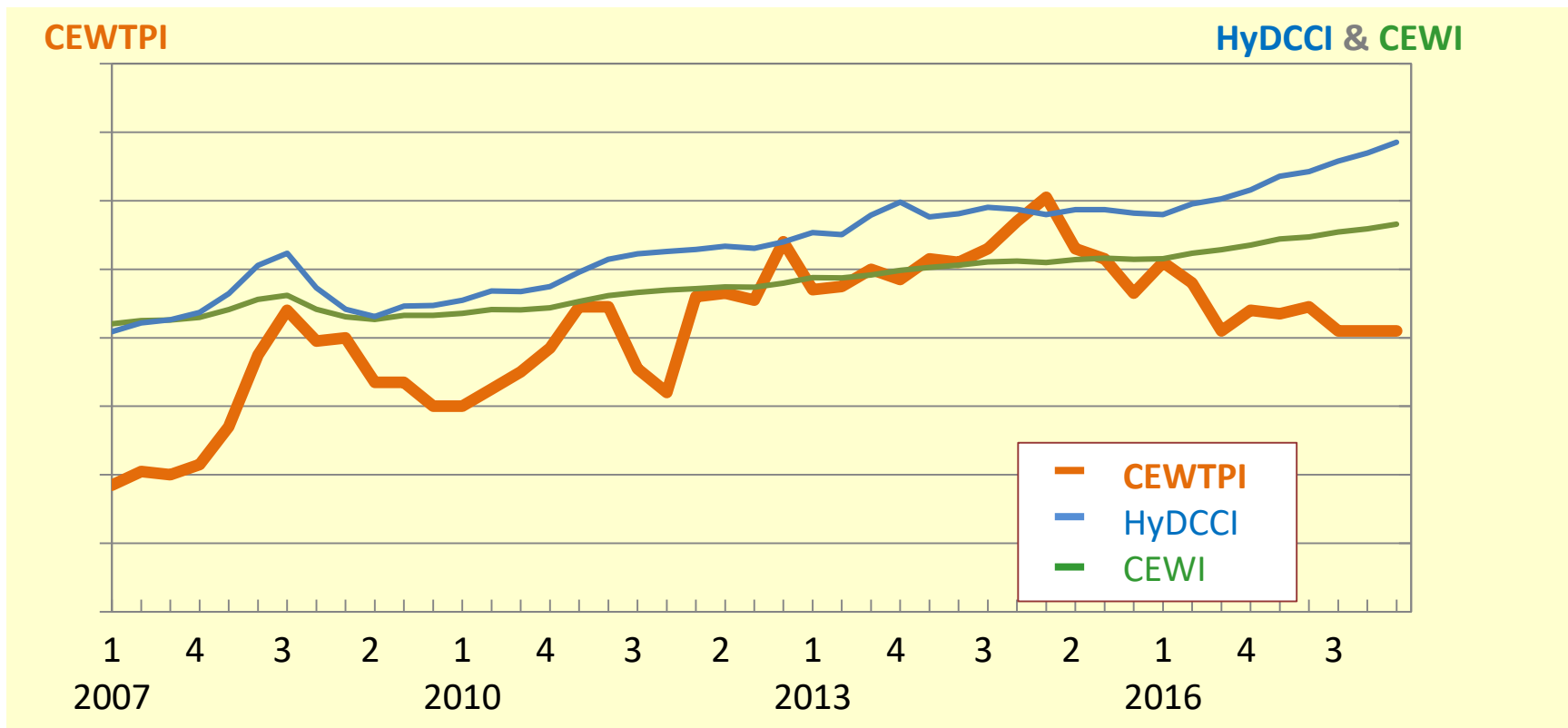
## *Segregation between Design and Construction*

- Need to have an encompassing design to avoid impossibility  
e.g. conservative pile design, higher CFA/NOFA ratio, trenchless, etc.
- Need to allow for unforeseen situations  
e.g. uncharted utilities
- Need to pay premium for transferring risks to contractors  
e.g. cost fluctuations risks, interfacing risks, temporary works risks, etc.

**High Cost + High Premium = High Price !!!!**



# Price Index vs Cost Index





# What Government as a public project owner wants?

- Don't want to exploit contractors or take advantage out of their difficulties
- Only pay for something executed
- Ensure the cost-effectiveness of public projects



# Cost-based Procurement

- Payment to the contractor on the basis of cost
- pay for something executed, cost incurred (e.g. labour/materials cost)
- Government can enjoy cost saving during works execution

**Cost-based Procurement** instead of **Price-based Procurement**



# Why NEC Open Book Target Cost?

- cost-based
- incentivize cost saving (pain-gain share)
- collaborative, not adversarial
- a well established international contract form



# Open Book Target Cost vs Price-based

	Cost-based (e.g. NEC Options C/D)	Price-based (e.g. GCC)
<b>Saving from contract prices</b>	<ul style="list-style-type: none"> <li>● Government pays less than the target cost if final actual costs &lt; contractor's estimate</li> </ul>	<ul style="list-style-type: none"> <li>● Government cannot enjoy cost saving even if final actual costs &lt; contractor's estimate</li> </ul>
<b>Extra risk premium</b>	<ul style="list-style-type: none"> <li>● Contractor needs not to price in extra risk premium for risks shared by Government</li> <li>● Government is willing to take up more risk in return of a lower tender premium and pays only when risks are materialised</li> </ul>	<ul style="list-style-type: none"> <li>● Contractor speculates extra risk premium for unknown risks</li> <li>● Government pays for the extra risk allowance which may not have materialised</li> </ul>
<b>Further cost saving</b>	<ul style="list-style-type: none"> <li>● Contractor has more incentive to adopt innovative and <b>cost effective alternative designs or construction methods to achieve cost savings</b></li> </ul>	<ul style="list-style-type: none"> <li>● Contractor has less incentive to propose innovative and cost-effective alternative designs or construction methods</li> </ul>
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# Major Large Scale Projects in Target Cost Options



Central Kowloon Route –  
Kai Tak East and Central Tunnel



In-situ Reprovisioning of Sha Tin  
Water Treatment Works - South Works



Relocation of Sha Tin  
Sewage Treatment Works to Caverns



Drainage Services Department Building  
at Cheung Sha Wan  
(Relocated from Revenue Tower)

*... many more  
to come!*

# PCMO Cost Management Model

Budget / Cost

## Budget Management

- Option selection
- Specifications
- Fitness-for-Purpose
- No-Frills
- Cost Estimation

## Expenditure Management

- Variations
- Cashflow
- *Cost-based procurement*
- AM/FM
- Life cycle cost

Time

Planning & Design

Construction



# Wider Collaboration



# International Collaboration



## MEMORANDUM OF UNDERSTANDING

**BETWEEN THE DEVELOPMENT BUREAU OF THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION OF THE PEOPLE'S REPUBLIC OF CHINA AND THE INFRASTRUCTURE AND PROJECTS AUTHORITY OF THE GOVERNMENT OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND**

In London, on 7 March 2018,

on one side, Hon Chi Keung, Permanent Secretary for Development (Works) of the Government of the Hong Kong Special Administrative Region of the People's Republic of China meets,

on the other side, Tony Meggs, Chief Executive of the Infrastructure and Projects Authority, part of Cabinet Office and HM Treasury, of the Government of the United Kingdom of Great Britain and Northern Ireland.

Both sides recognise the complexity of implementing infrastructure projects and the challenges and opportunities in the delivery of Hong Kong and the UK's ambitious infrastructure programmes. The Development Bureau of the Government of the Hong Kong Special Administrative Region of the People's Republic of China and the Infrastructure and Projects Authority of the Government of the United Kingdom of Great Britain and Northern Ireland (hereinafter each referred to as a "Participant" and collectively referred to as the "Participants") recognise each other's level of expertise and longstanding experience in infrastructure project management and delivery.

The Participants, after friendly consultation with each other, hereby reach the following understanding:

### FIRST

The Participants believe that this Memorandum of Understanding represents the beginning of a lasting and fruitful cooperation between both sides, and state that the goal of this collaboration is to exchange expertise, experience and information in order to continuously assess and improve the performance and financial and cost management of infrastructure systems, networks, assets and projects.

### SECOND

The Participants wish to uplift the productivity and performance of the construction industry in their respective markets including by adopting digital technology, such as Building Information Modeling, and innovative methods of construction.

### THIRD

The Participants wish to improve the project delivery capability of the public sector by enhancing the training and knowledge of project leaders.

### FOURTH

The proposed cooperation under this Memorandum of Understanding is non-exclusive and will continue until 6 March 2021, unless terminated earlier by: (a) either Participant by notice in writing to the other Participant at any time or (b) the law of either of the Participants prevents or disallows the continuation of this Memorandum of Understanding or its implementation. Any modifications or extension to this Memorandum of Understanding will be made in writing and subject to the consent of the Participants.

In the event of termination or discontinuation of this Memorandum of Understanding, the Participants will take all necessary actions as may be required to promptly and orderly terminate any joint activity carried out under this Memorandum of Understanding.

### FIFTH

To facilitate cooperation under this Memorandum of Understanding, the Participants have designated the Head of Project Cost Management Office, Development Bureau of the Government of the Hong Kong Special Administrative Region of the People's Republic of China and Deputy Chief Executive, Infrastructure and Projects Authority of the Government of the United Kingdom of Great Britain and Northern Ireland as their respective contact points, with details set out in Appendix A hereto.


This Memorandum of Understanding is not intended to create, and does not create, legally binding obligations or liabilities between the Participants under international law.

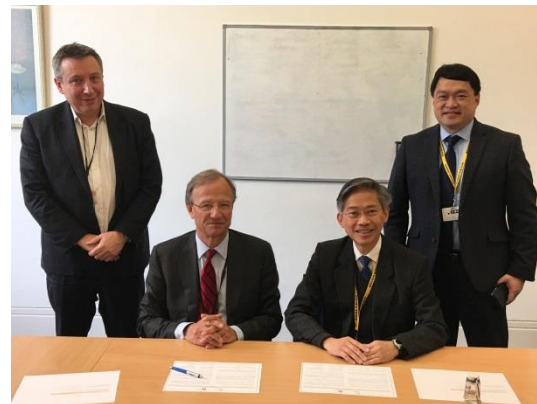
This Memorandum of Understanding is signed in duplicate in English, in London on 7 March 2018.

For and on behalf of the Infrastructure and Projects Authority of the Government of the United Kingdom of Great Britain and Northern Ireland:

  
Tony Meggs  
Chief Executive, Infrastructure and Projects Authority

For and on behalf of the Development Bureau of the Government of the Hong Kong Special Administrative Region of the People's Republic of China:

  
Hon Chi Keung  
Permanent Secretary for Development (Works)



# Project Cost Management Office

- **Enhancing Project Governance**

- Promote cost-based procurement (and early contractor involvement!!)
- Encourage adoption of innovation and advance technology
- Monitoring project finance throughout planning, design, construction stage
- Establishing cost information database and enhance ERA
- International collaboration

- **Uplifting Project Delivery Capability**

- Major Project Leaders Academy
- Project Capability Building for construction professionals
- System re-engineering for maximising delivery performance
- Professionalism, commercial mindset and efficient execution





# NEC Journey in Hong Kong

Fuk Man Road Nullah Improvement (1<sup>st</sup> Contract)



Happy Valley Underground Stormwater Storage Scheme (1<sup>st</sup> Contract > \$HK1B)



Practice Notes for ECC, TSC & PSC



Cross Bay Link, TKO (Target Cost Contract ~ \$HK2.6B)



2009

2010

2012

2016

2017

2018



Fanling Highway Noise Barriers (2<sup>nd</sup> Contract)



Tseung Kwan O - Lam Tin Tunnel - Road P2 and Associated Works (Target Cost Contract ~HK\$2.4B)



Tung Chung East Reclamation (Largest Contract ~HK\$12B)



Drainage Improvement Works in Mong Kok (1<sup>st</sup> NEC4 PSC)



# NEC Journey in Hong Kong



## DSD project - Improvement of Fuk Man Road Nullah in Sai Kung (HK\$76M)

- ✓ 1<sup>st</sup> Government NEC ECC
- ✓ Option C was selected
- ✓ Awarded in 2009 and completed in 2012
- ✓ 15% time saving (6 month ahead)
- ✓ 5% cost saving (\$4.1M shared gain)



NEC Consultant - EC Harris (now Arcadis?)

NEC Legal Adviser - Lovells (now Hogan Lovells)

DSD Contract Adviser - John Kwong (still John Kwong) 🥰





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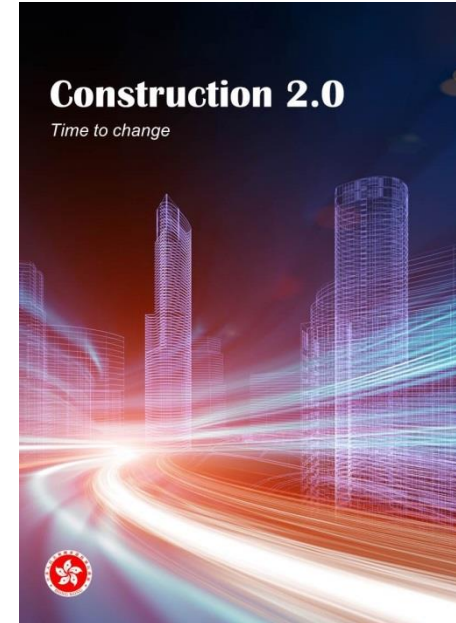
# NEC vs GCC



- Government directive
- World trend of collaborative contracting
- Keep up to date with technology and supply chain development
- Drive for better project performance



- Fading out
- No maintenance
- Cannot cope with rapid changes in construction industry





# NEC in Hong Kong

Hong Kong SAR Government will  
strive to delivering cost effective  
public works projects through  
NEC Target Cost Contracts





# Delivering Cost Effective Public Works Projects through Cost-based Procurement

**Thank You**

