



Half Day CONFERENCE at The University of Hong Kong on:

18 January 2011, Hong Kong

Wang Gungwu Theatre, Graduate House, The University of Hong Kong, HK

You are cordially invited to participate in the above event organised by the **Centre for Infrastructure & Construction Industry Development (CICID)** of **The University of Hong Kong**. This event will be an important milestone in a research project on **‘Evaluating Construction Industry Development’**, supported by the Hong Kong Research Grants Council, and launched **in parallel with comparative studies in Singapore and UK**.

This half day conference brings together industry experts to provide a panoramic overview of construction industry development in Hong Kong and the way forward. These will be juxtaposed against overviews of construction industry developments in Singapore and UK.

Join us in a morning of knowledge exchange & dissemination blending Hong Kong highlights with international insights into initiating, propagating, nurturing and benefiting from construction industry development initiatives. Refer programme below for details on presentation topics and speakers.

PROGRAMME		
08.30 – 09.00	Registration & Refreshments	
09.00 – 09.10	Welcome Address & Introduction	Prof. Albert Kwan Head of Dept. of Civil Eng., The Univ. of Hong Kong, HK
09.10 – 09.30	Key Note: Construction Industry Development – Vision, Actions & Achievements	Ir Christopher To Executive Director, Construction Industry Council, HK
09.30 – 09.50	Key Note: A Robust Construction Industry–The Government’s Role and Perspective	Ir Enoch T.S. Lam, JP Deputy Secretary (Works), Development Bureau, HK
09.50 – 10.10	Key Note: Dynamics, Concerns and Challenges for Construction Industries	Mr Chew Tai-chong Projects Director, MTR Corporation Ltd, HK
10.10 – 10.30	Key Note: Free Market and Construction Industry Development	Ir Billy Wong Wing-hoo, JP General Manager, Henderson Land Development Co. Ltd., HK
10.30 – 10.45	Q & A	
10.45 – 11.00	Refreshment Break	
11.00 – 11.30	Construction Industry Development - a Hong Kong perspective	Prof. Mohan Kumaraswamy The University of Hong Kong, HK
11.30 – 12.00	Developing the Construction Industry in Singapore	Prof. George Ofori National University of Singapore, Singapore
12.00 – 12.30	Construction Sector Reform in the UK	Prof. Stuart Green University of Reading, UK
12.30 – 12.45	Q & A	
12.45 – 13.00	Closing Remarks	Ir C.K. Mak, GBS, JP Vice Chairman, CICID, HK

REGISTRATION

- ❖ Conference Registration is FREE
- ❖ Registrants are entitled to receive ATTENDANCE CERTIFICATES
- ❖ Places are limited and registration is on ‘FIRST COME’ basis.

Please visit http://hkuems1.hku.hk/hkuems/ec_regform.aspx?guest=Y&UEID=15121 for registration

Enquiries: Ms. Bridget Lam by email at ppps@hku.hk, or by phone at (852) 2859 2666.

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Centre for Infrastructure & Construction Industry Development
The University of Hong Kong



COLLABORATORS



HONG KONG

Symposium

CIDCA



Construction Industry Development - Comparison and Acceleration

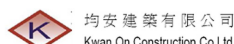
18 January, 2011

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Symposium Organising Committee

Chairman	Prof Mohan Kumaraswamy
Depty-Chairman	Dr Gangadhar Mahesh
Vice-Chairmen	Ir Sam Chan, Dr Jacky Chung
Secretaries	Ms Brenda Xie, Ms Junqi Zhang
Committee members	Mr Yat-wah Fong, Ms Bridget Lam, Mr Scott Pu, Mr Ricardo Ramirez, Mr Kelwin Wong, Mr Joe Zou
Acknowledgement	Civil Engineering Society, HKU

Construction Industry Development – Vision, Actions & Achievements

Ir Christopher To

Executive Director, Construction Industry Council, HK

A Robust Construction Industry–The Government’s Role and Perspective

Ir Enoch T.S. Lam, JP

Deputy Secretary (Works), Development Bureau, HK

Dynamics, Concerns and Challenges for Construction Industries

Mr Chew Tai-chong

Projects Director, MTR Corporation Ltd, HK

Free Market and Construction Industry Development

Ir Billy Wong Wing-hoo, JP

General Manager, Henderson Land Development Co. Ltd., HK

Construction Industry Development - a Hong Kong perspective

Prof. Mohan Kumaraswamy

The University of Hong Kong, HK

Developing the Construction Industry in Singapore

Prof. George Ofori

National University of Singapore, Singapore

Construction Sector Reform in the UK

Prof. Stuart Green

University of Reading, UK

Construction Industry Development – Vision, Actions & Achievements

Ir Christopher To

Executive Director, Construction Industry Council, HK



Construction Industry Development – Vision, Actions and Achievements

January 2011

1

Contents

- Vision and Mission
- Functions of CIC
- Highlights of Recent Work
- Main Issues under Consideration
- Research
- Conferences & Seminars

2

Global Issues which the Construction Industry is now facing and the Challenges ahead

- Regulations
- Risks
- Governance
- Operations - Productivity
- Strategy and Growth
- Talent
- Innovation and Technology
- Sustainability and Climate Change

3

Perception can change one's mind set at looking at matters

<http://www.youtube.com/watch?v=-pXPmr3UsXA>

4

Vision and Mission

Vision

To drive for unity and excellence of the construction industry of Hong Kong.

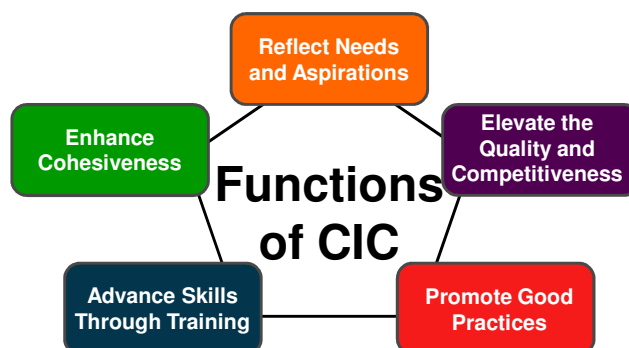
Mission

To strengthen the sustainability of the construction industry in Hong Kong by providing a communications platform, striving for continuous improvement, increasing awareness of health and safety, as well as improving skills development.

5

Functions of CIC

- Functions of the CIC are stipulated in Sections 5&6 of the Construction Industry Council Ordinance (Cap.587)



6

Highlights of Work Done

Following guidelines are published:

- Guidelines on Dispute Resolution (September 2010)
- Guidelines on Partnering (August 2010)
- Guidelines on Measures for Protection of Workers' Wages (August 2010)
- Guidelines on Safety of Tower Cranes (Version 2 - July 2010)
- Guidelines on Safety of Lift Shaft Works: Volume 1 - During Construction Stage and Before Handing Over to Lift Installation Contractor (July 2010)
- Guidelines on Administration Charges for Reporting of Site Accidents (August 2008)
- Guidelines on Site Safety Measures for Working in Hot Weather (June 2008)
- Guidelines on Safety of Site Vehicles and Mobile Plant (June 2008)

7

Highlights of Work Done

- Operate the Voluntary Subcontractor Registration Scheme (VSRS).
- Set up of the Hong Kong Green Building Council (HKGBC) in November 2009 and providing administrative support to the HKGBC.
- Complete a review on Local Construction Standards with a Review Report produced
- Prepare the Codes of Conduct for Construction Personnel

8

Main Issues under Consideration

Manpower

- Develop a model to forecast the needs of workforces
- “Enhanced Construction Manpower Training Scheme” being developed by the CIC in collaboration with the government
- Under the scheme, trainee will be paid by the government HK\$5,000/month for training provided by the CIC; employer will pay HK\$[10,000]/month for 1st six months of employment and then HK\$[15,000]/month for a further six months.
- Provide new courses to meet the demand of skilled workforces for the ten infrastructure projects

9

Main Issues under Consideration

Safety

- Site safety of working in lift shaft
- Work safety of repair, maintenance, alternations and additions (RMAA) sites
- Working in hot weather
- Application of mediation on construction injuries dispute
- Promotion of the pay for safety scheme (PFSS)

10

Main Issues under Consideration

Technology

- Adhesion technologies for external wall tiles and rendering
- River sand substitutes for concrete production and cement sand mortar production
- Application of Radio Frequency Identification (RFID) and Global Positioning System (GPS) in construction works
- Standardisation and modularisation of construction components
- Building Information Modelling (BIM)

11

Main Issues under Consideration

Procurement

- Working on the Guidelines on Contract Price Fluctuation System for Private Sector Construction Contracts
- Recommendation on Selection of Consultants and Contractors
- Partnering and Collaborative working

12

Main Issues under Consideration

Subcontracting

- Identifying the needs of security of payment legislation
- Enhancement to the voluntary Subcontractor Registration Scheme (VSRS stage 2)
- Model clauses for new dispute resolution mechanism
- Standard form of subcontracts

13

Research

Current Research Projects

- Management of Heat Stress on Construction Workers in Hot and Humid Weather
- Adhesion Technologies for External Wall Tiles and Rendering
- Establishing a Hong Kong Based Carbon Labeling Framework for Construction Materials
- Study of the Definition and Scope of Duties of Site Supervision Personnel for the Construction Industry of Hong Kong
- Manpower Research for the Construction Industry of Hong Kong
- Key Performance Indicators
- Zero Carbon Building

14

Conferences & Seminars

Organising / co-organising conferences / seminars

- Technical Seminar on Safety of Lift Shaft Works, 5 Nov 2010
- Construction Technology Forum, 10 Dec 2010
- Seminar on Collaborative Contracting Approach, 12 Jan 2011
- Technical Seminar on Safety of Lift Shaft Works, 27 Jan 2011
- CIC Inauguration Conference, 11 Mar 2011
- Technical Seminar on Tower Crane (to be confirmed)
- Technical Seminar on Wider use of Standardised and Modular Components, and Prefabrication in Construction Projects (to be confirmed)

15



Thank You!

www.hkcic.org

16

**A Robust Construction Industry–The Government’s Role and
Perspective**

Ir Enoch T.S. Lam, JP

Deputy Secretary (Works), Development Bureau, HK

**A Robust Construction Industry
The Government's Role and Perspective**

**Hong Kong Symposium
Construction Industry Development – Comparison and Acceleration**



by **Enoch T S LAM** 18 Jan 2011

**A Robust Construction Industry
The Government's Role and Perspective**

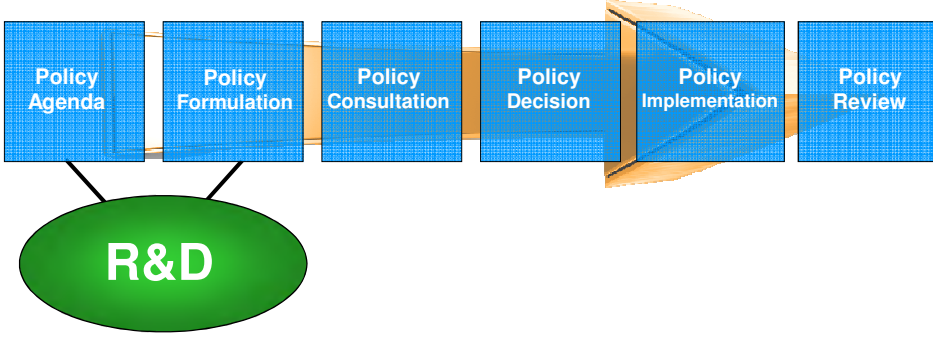
Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion

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Construction Industry Development – Comparison and Acceleration

Policy

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion
2007-08 Policy Address A New Direction for Hong Kong 					
Hong Kong Symposium Construction Industry Development Comparison and Acceleration			A Robust Construction Industry The Government's Role and Perspective		

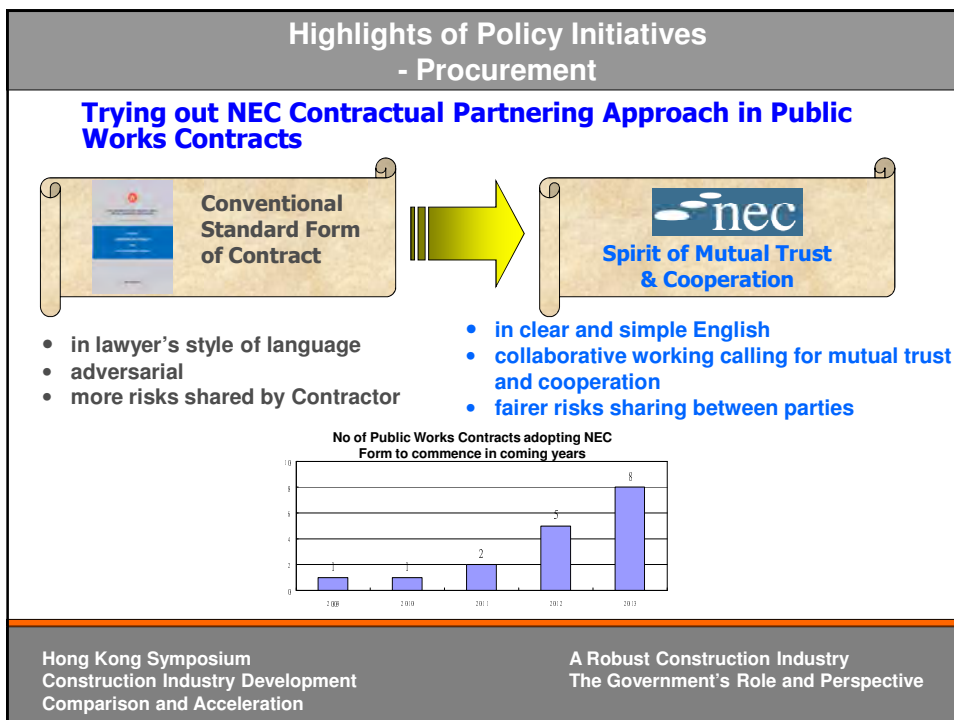
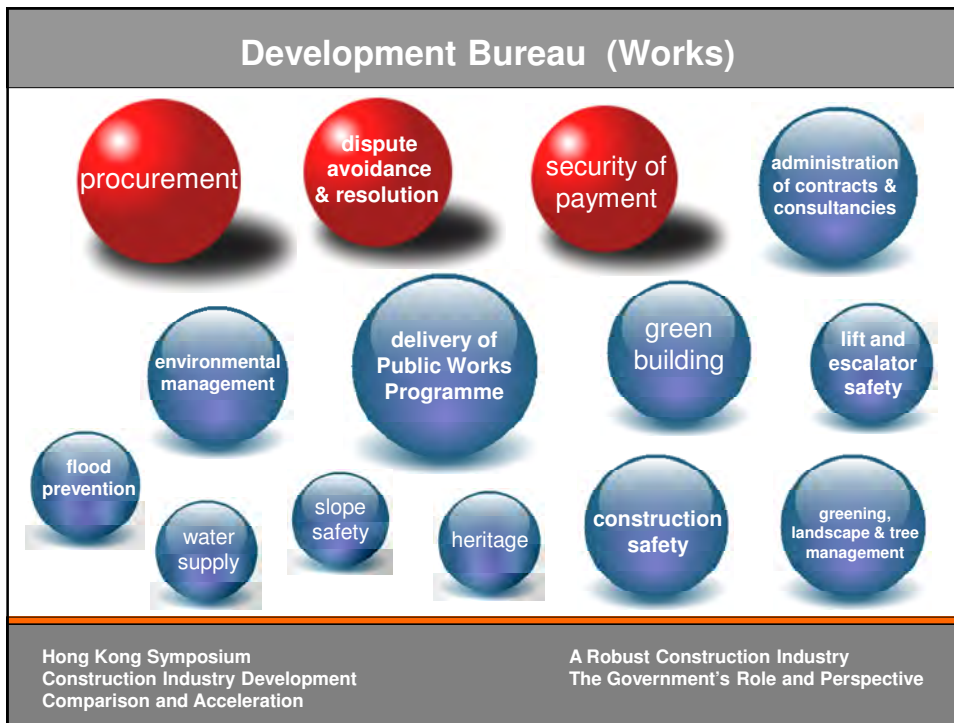
Policy Setting



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    graph LR
      A[Policy Agenda] --> B[Policy Formulation]
      B --> C[Policy Consultation]
      C --> D[Policy Decision]
      D --> E[Policy Implementation]
      E --> F[Policy Review]
      R([R&D]) --- A
      R --- B
      R --- C
  
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Hong Kong Symposium Construction Industry Development Comparison and Acceleration						A Robust Construction Industry The Government's Role and Perspective					
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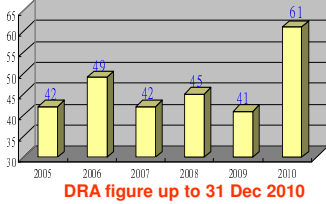
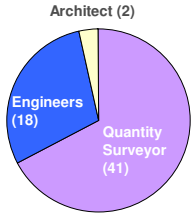
Highlights of Policy Initiatives - Dispute Avoidance & Resolution

Dispute Resolution Advisor (DRA)

- Adopted in many building works contracts by ArchSD and HA
- Promoting wider use of DRA in civil engineering contracts

Alternative Dispute Resolution (ADR) Options

- Open to ADR options other than mediation and arbitration

DRA figure up to 31 Dec 2010

Architect (2)
Engineers (18)
Quantity Surveyor (41)

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Highlights of Policy Initiatives - Security of Payment

Carry out Industry-wide Survey on Payment Practice of Construction Industry

- To ascertain magnitude of payment problems
- To seek views on measures to improve **Security of Payment** in construction industry



Overseas Security of Payment Legislation (United Kingdom, Australia, Singapore & New Zealand)



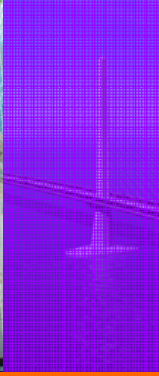

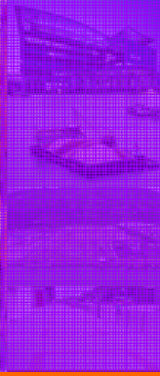

- Rights to progress payments
- Rights to adjudication
- Prohibit "pay if paid" and "pay when paid" terms
- Rights to suspend work in the event of non-payment



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Legislation

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion
					

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Why Legislation?

- Confer enforceable rights on citizens or organizations
- Impose fees, charges, taxes or levies
- Create offences and impose penalties
- Impose obligations on citizens or organizations
- Effect significant impact on individual rights and liberties
- Amend existing Ordinances



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Highlights of Recent Legislation of DEVB

Construct for Excellence
Report of the Construction Industry Review Committee

18. As for construction workers, we support in principle the Construction Advisory Board's proposal to implement a construction worker registration scheme.

37. To provide a focus for the construction industry's reform efforts and to foster better co-ordination within the industry, we recommend the establishment of an industry co-ordinating body in the form of a statutory body to deliberate and generate consensus on pan-industry strategic issues, and to communicate the industry's needs and aspirations to the Government.

→ **CWRO (CAP 583) enacted & CWRA established in 2004**

→ **CICO (CAP 587) enacted in 2006 & CIC established in 2007**

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Highlights of Recent Legislation of DEVB

The timeline shows the following key events:

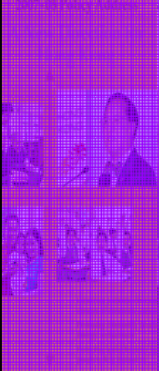
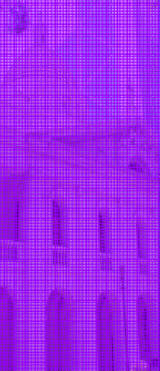




- 2001 (Jan):** CIRC report
- 2004 (Jul):** CWRO (CAP 583) enacted
- 2004 (Sep):** CWRA established
- 2006 (May):** CICO (CAP 587) enacted
- 2007 (Feb):** CIC established
- 2008 (Jan):** Amalgamation of CIC and CITA → CICTA
- 2011 (Orange arrow):** Construction Workers Registration Authority established

Logos for the Construction Industry Council (建造業議會) and Construction Workers Registration Authority (建造業工人註冊管理局) are shown for 2011.

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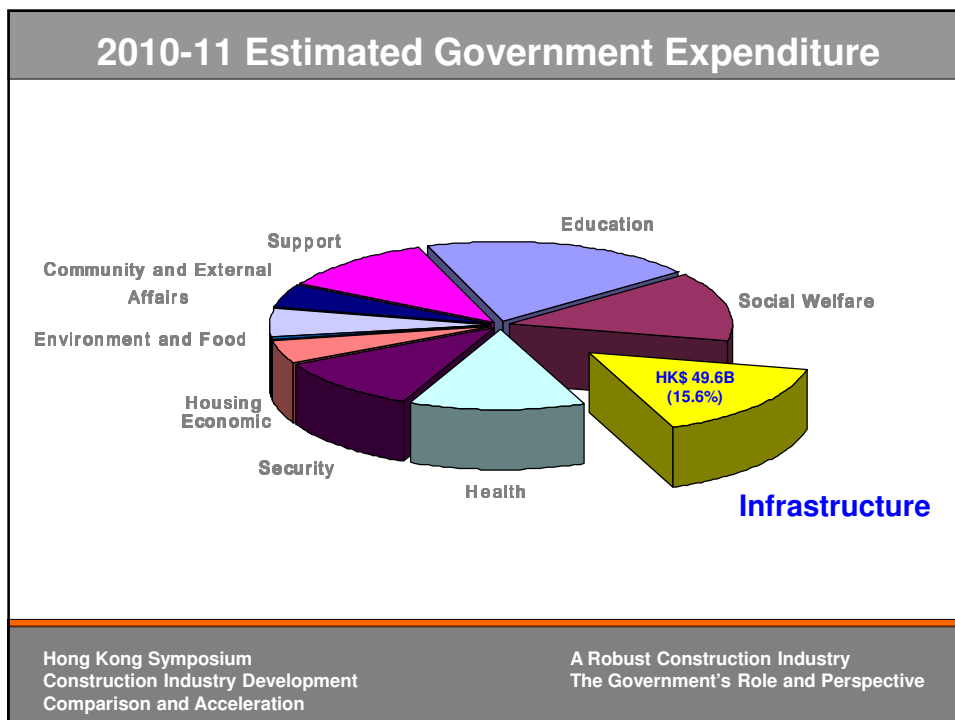
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Financial Resources

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion
					

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2010 - 11 Budget Speech

Economic Development

- Investing in Infrastructure
- Promoting Development of industries

Economic Prospect

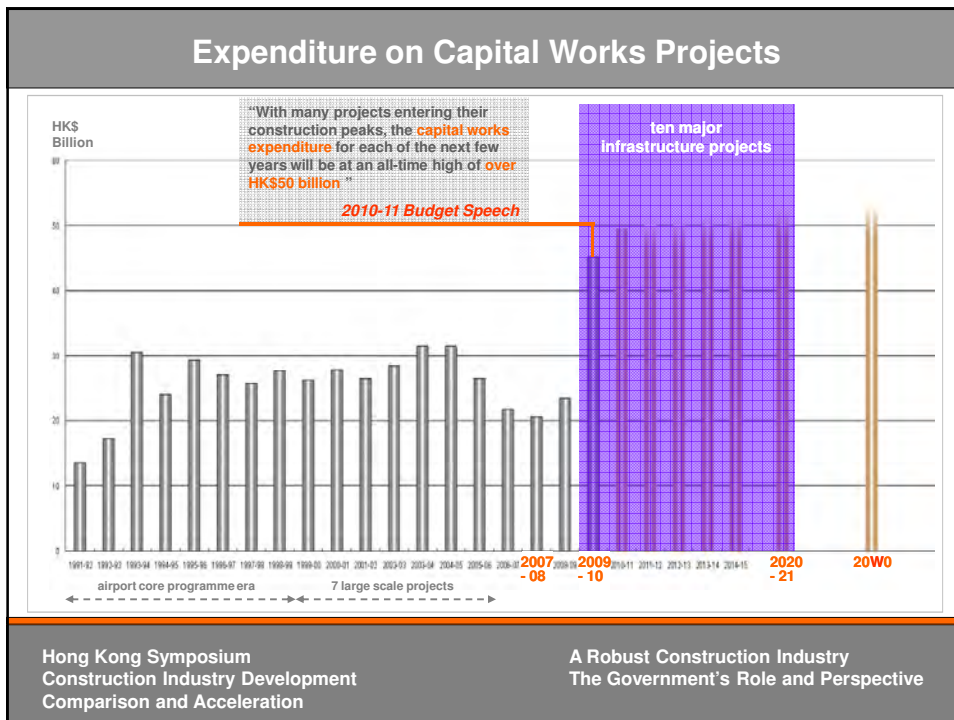
- Fostering a Healthy Property Market

Caring Society

- Developing Human Capital
- Supporting Learning
- Promoting Building Maintenance
- Redeveloping Old Areas
- Promoting Culture and Sport
- Fighting Drugs
- Strengthening Public Healthcare
- Caring for the Needy
- Supporting Job Seekers
- Relief Measures

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Ten Major Infrastructure Projects

1. South Island Line
2. The Sha Tin to Central Link
3. The Tuen Mun Western Bypass and Tuen Mun-Chek Lap Kok Link
4. The Guangzhou-Shenzhen Hong Kong Express Railway Link
5. Hong Kong-Zhuhai-Macao Bridge
6. Hong Kong-Shenzhen Airport Co-operation
7. Hong Kong-Shenzhen Joint Development of the Lok Ma Chau Loop
8. West Kowloon Cultural District
9. Kai Tak Development
10. New Development Areas

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Ten Major Infrastructure Projects

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Other Major Capital Works Projects



CENTRAL WANCHAI BYPASS



HONG KONG WEST DRAINAGE TUNNEL



TSEUNG KWAN O SPORTS GROUND



HARBOUR AREA TREATMENT SCHEME



TAMAR DEVELOPMENT PROJECT

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Manpower Resource

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion
					

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Previous Studies on Manpower Resources

University of Hong Kong

Study on Manpower of Professionals

- Slight to moderate shortage
- Situation manageable
- High caliber students

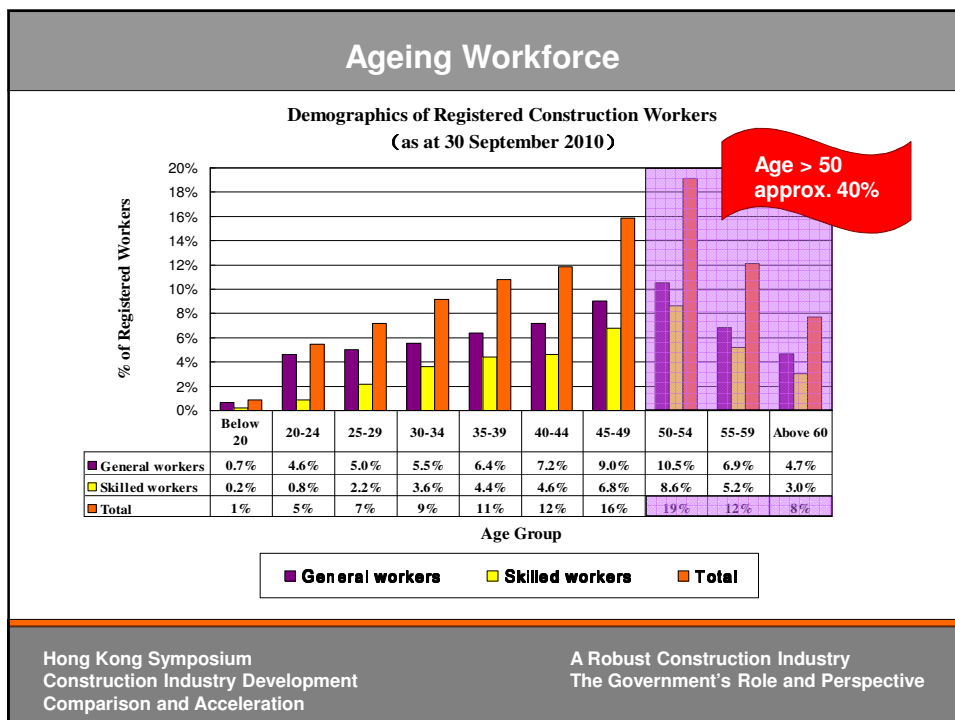
City University of Hong Kong

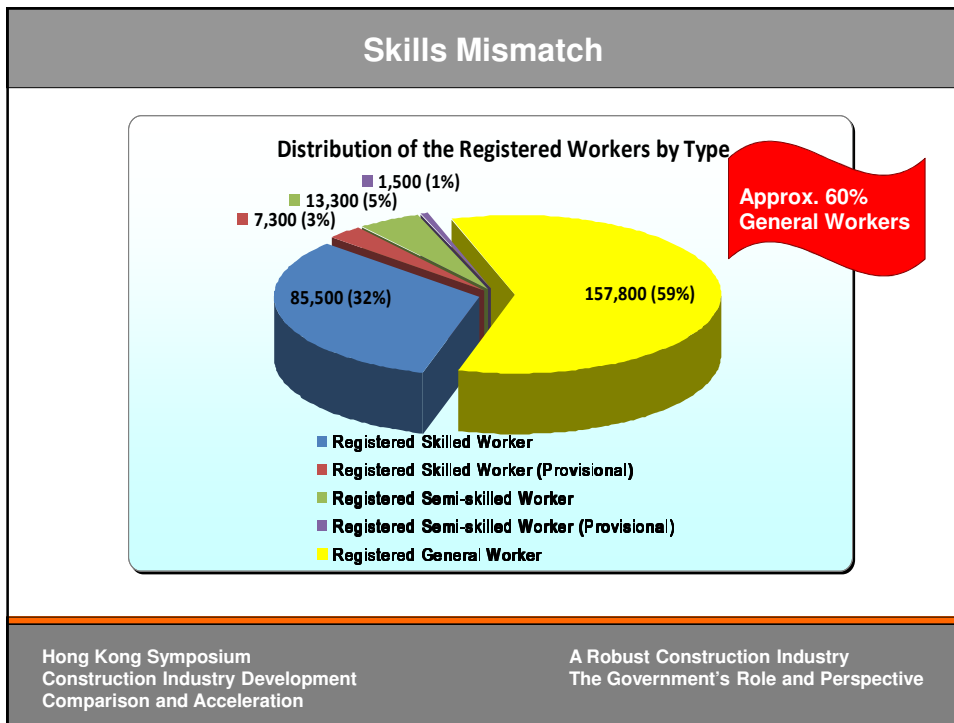
Study on Manpower of Workers

- Ageing workforce
- Skills mismatch


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2010 – 11 Budget Speech



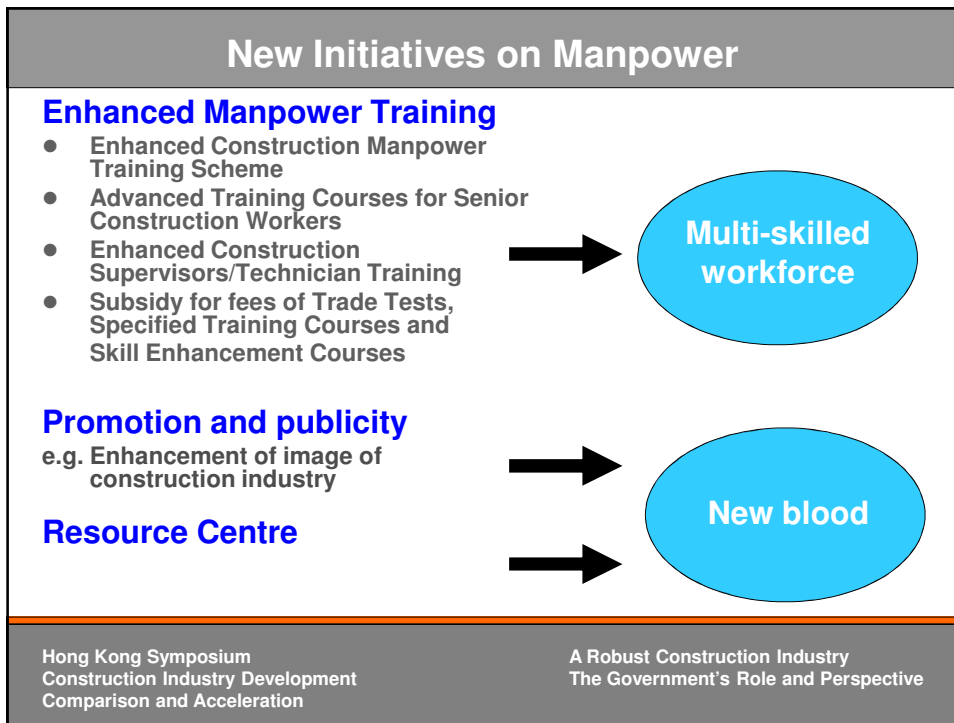
*\$100M approved
by LegCo FC
on 28 May 2010*

58. We are also mindful of the ageing problem and possible skills mismatch in the construction workforce. Currently, the Construction Industry Council (CIC) strives to attract more people, especially young people, to join the construction industry through training and trade testing. Furthermore, the CIC aims to enhance the skills and competitiveness of in-service construction workers and to uplift the image of the industry through promotion and public education. **Together with the industry, we will take the lead to introduce best practices in public works projects to further improve the safety, working environment and conditions in construction sites. I will also earmark \$100 million to support the CIC to strengthen the relevant work, and I expect that the CIC will increase its investment in tandem with this funding to provide the necessary incentives to attract more young people to join the construction industry and to improve the practice of the industry. We believe that these measures can help attract fresh blood to the industry and meet the manpower needs of future construction projects.**

-- 2010-11 Budget Speech

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Sustainable Construction

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Service Promotion
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Current Challenges

- Supply of Construction Materials (sand)**

Quantity of Natural Sand from Mainland (million tonnes)

Year	Quantity (million tonnes)
2005	6.5
2006	4.5
2007	4.0
2008	2.5
2009	2.0
2010	1.5

Sand supply sources

Guangdong → Hong Kong

Hainan → Hong Kong
- Disposal of Public Fill and Contaminated Mud**

Public Fill Generation & Demand & Fill Bank Capacity (million tonnes)

Year	Generation	Demand	Fill Bank Capacity
2009	10	10	-5
2010	15	15	-10
2011	20	20	-15
2012	25	25	-20
2013	20	20	-25
2014	15	15	-30
2015	10	10	-35
2016	5	5	-40

Contaminated Mud Generation and Mud Pits Capacity (million m³)

Year	Mud Generation	Mud Pits Capacity
2009	1.5	-3.0
2010	2.0	-3.5
2011	2.5	-4.0
2012	3.0	-4.5
2013	3.5	-5.0
2014	3.0	-5.5
2015	2.5	-6.0
2016	2.0	-6.5

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Current Challenges

- Green Buildings**


All new government buildings with construction floor area > 10,000m²

↓

Second highest grade or above green building rating (e.g. BEAM plus)
- Green Procurement**

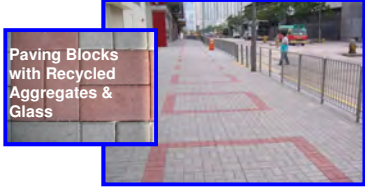
Paving blocks with recycled aggregates & glass
- Low Carbon Construction**

New consultancy study on low carbon construction for Hong Kong



Platinum Building Environmental Assessment Method (BEAM Plus)

Stanley Complex



Paving Blocks with Recycled Aggregates & Glass

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Construction Service Promotion

Policy	Legislation	Financial Resource	Manpower Resource	Sustainable Construction	Construction Service Promotion
					

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2011 Mainland and Hong Kong Construction Industry Forum

Theme

- **Sustainable Urban Form - Preservation and Development of Historical and Cultural cities**

Date

- May 2011

Venue

- Luoyang, Henan Province



2010 Mainland and Hong Kong Construction Industry Forum



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9th Ministers' Forum on Infrastructure Development in the Asia-Pacific Region

Theme

- **Sustainable Urbanization**

Date

- 15 – 16 December 2011

Venue

- Hong Kong Convention and Exhibition Centre



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Conclusion

Government **Contractors & Subcontractors** **Workers** **Universities**

Consultants **Developers of Public & Private Sectors** **Training Institutes** **Professional Institutions**

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Thank You

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Dynamics, Concerns and Challenges for Construction Industries

Mr Chew Tai-chong

Projects Director, MTR Corporation Ltd, HK



Dynamics, Concerns and Challenges for Construction Industry Development

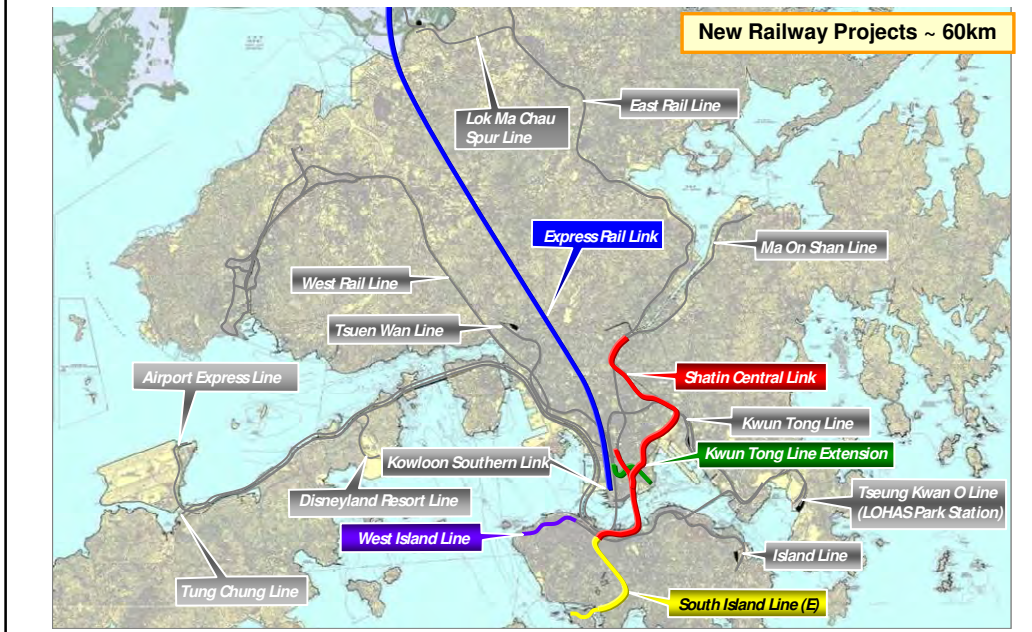
TC Chew
Projects Director, MTR Corporation

Agenda

- Human Resources
- Safety
- Technical & Environmental Concerns
- Relationship among Employer, Government, Consultants & Contractors (Stakeholder Engagement)



Current & Future Railway Construction Projects

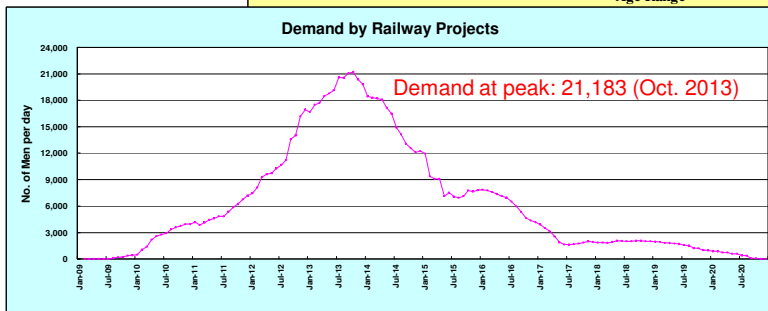
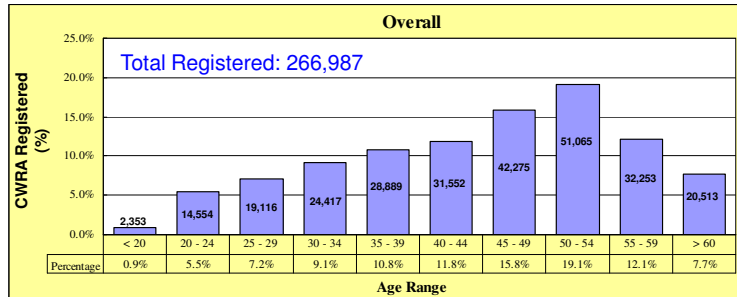


Human Resources



Overall Labour Situation

(Construction Workers Registration Authority as at 30 Sep 2010)



MTR Corporation

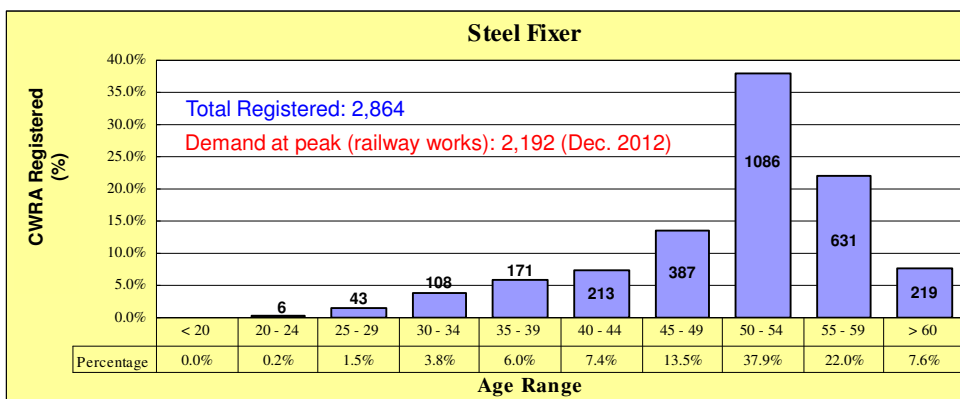
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Page 5



Labour Supply and Age Distribution

(Construction Workers Registration Authority as at 30 Sep 2010)

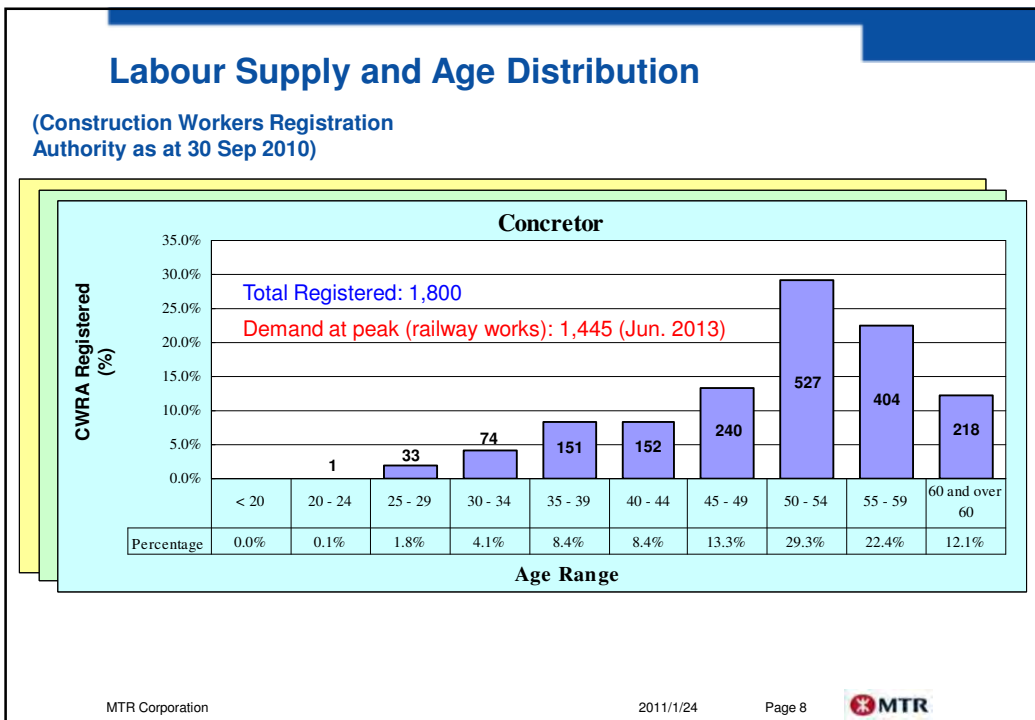
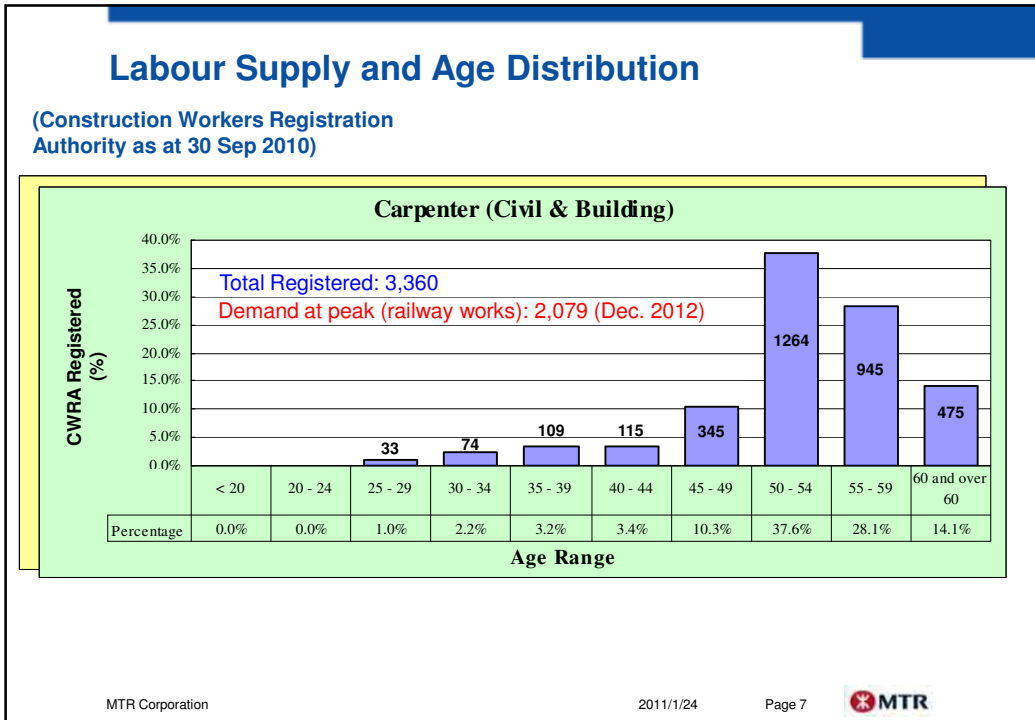


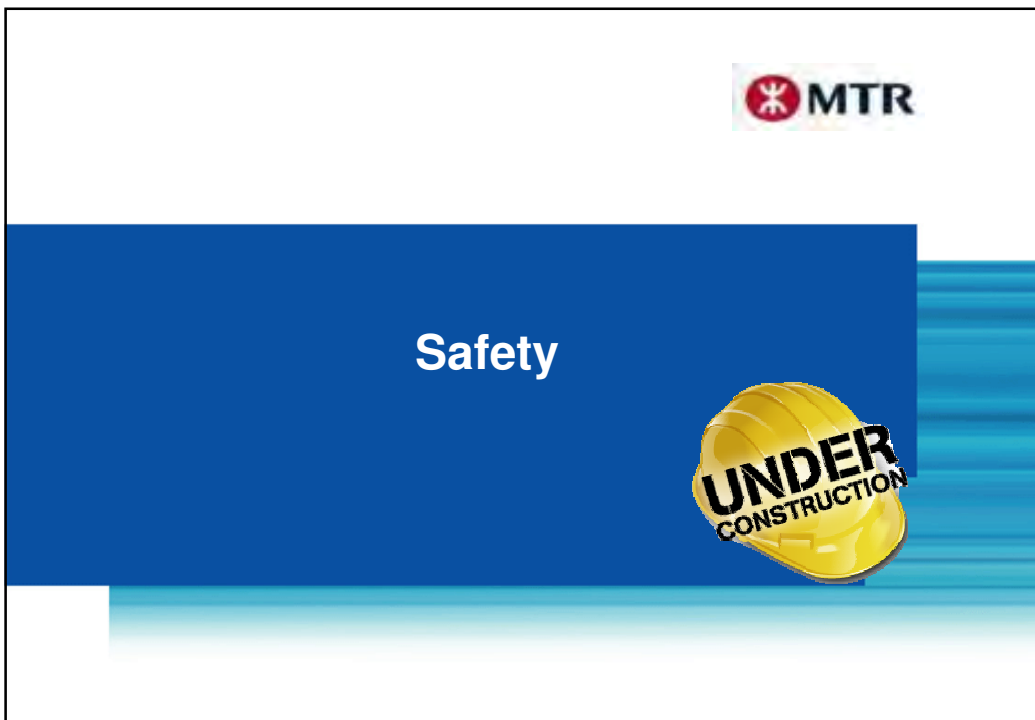
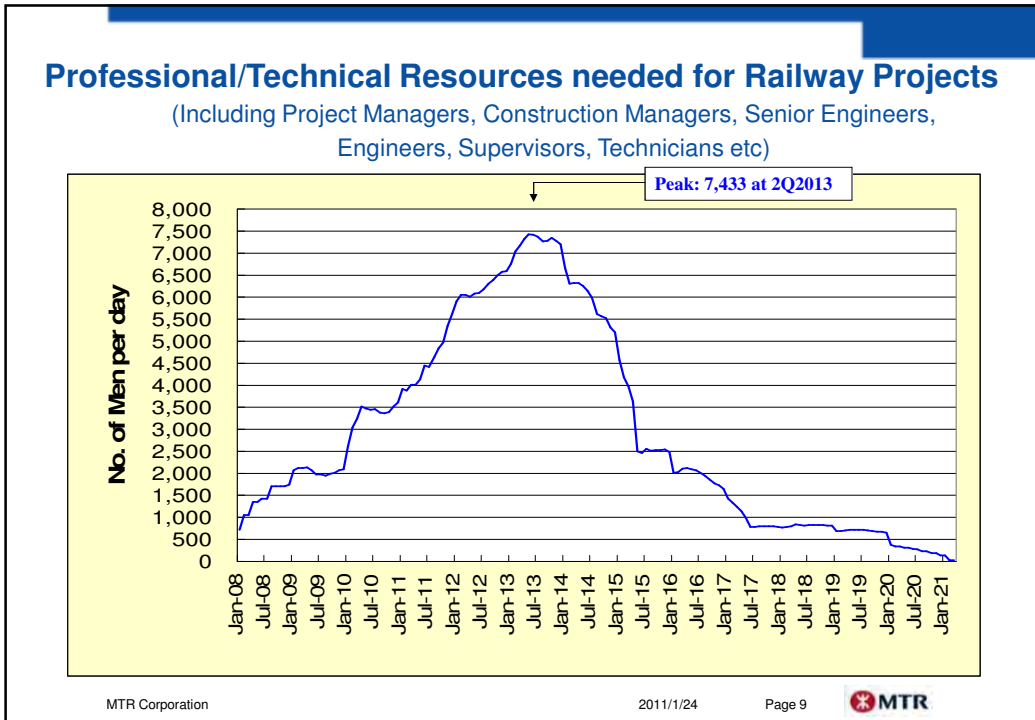
MTR Corporation

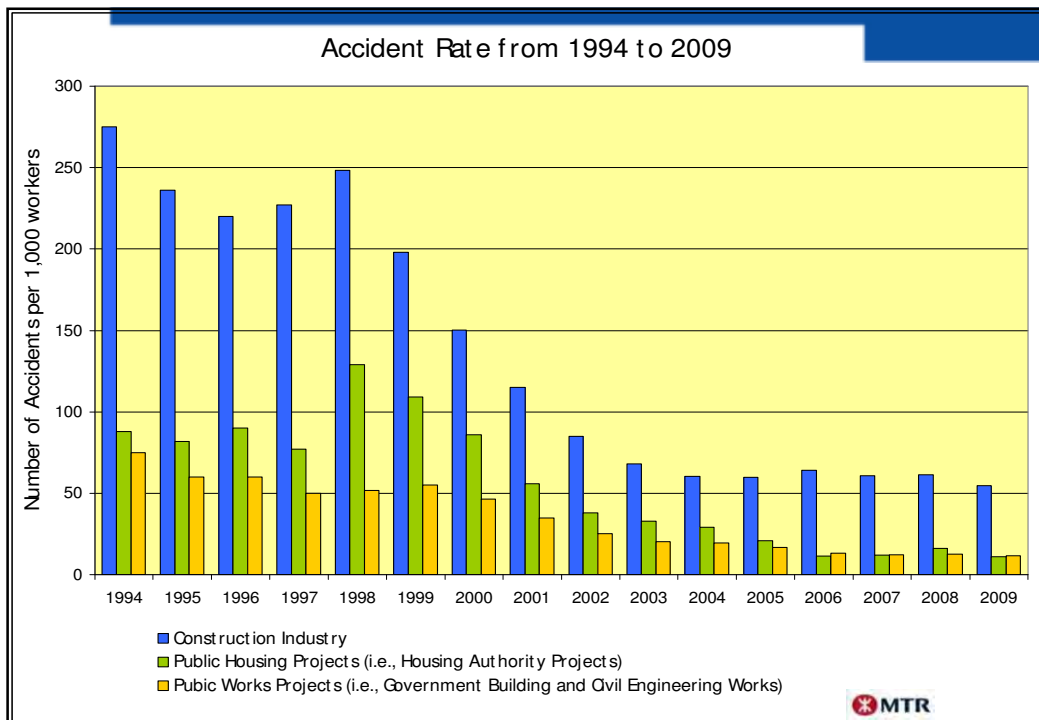
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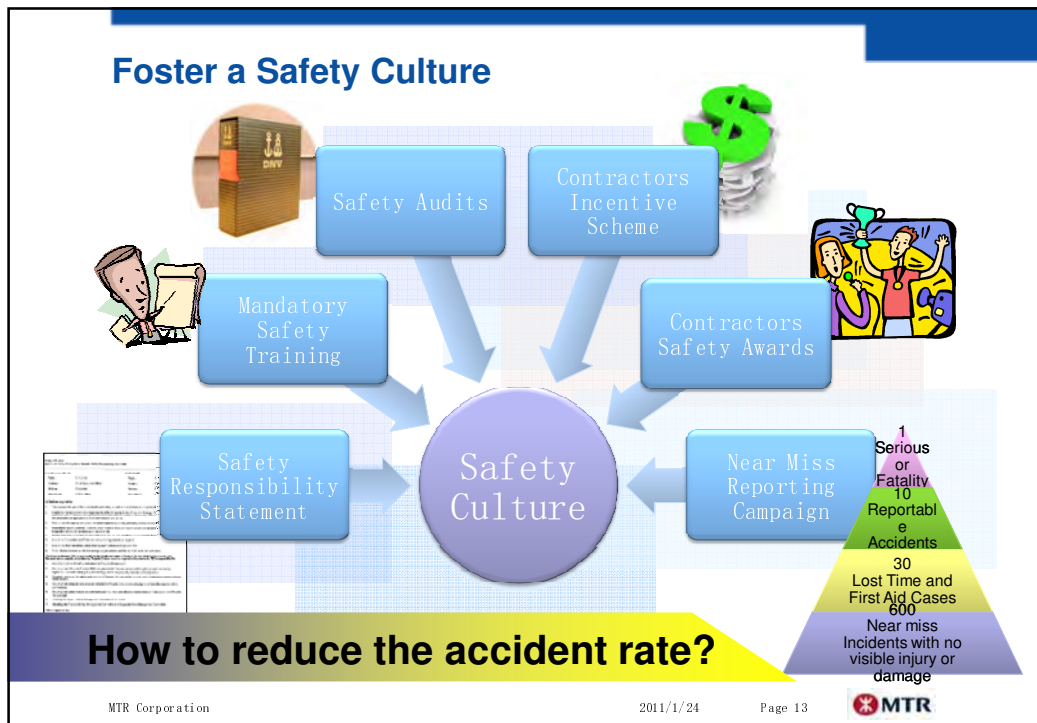
Page 6



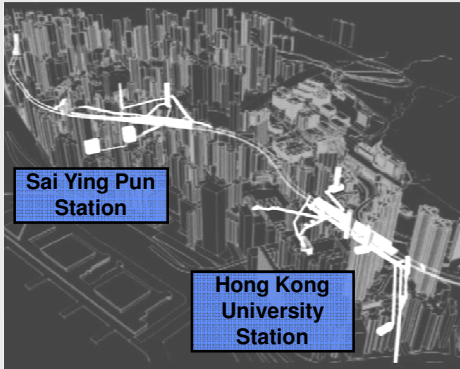










What is UNDER the Ground ?



MTR Corporation 2011/1/24 Page 15




Unforeseen and uncharted Underground Utilities




Unforeseen Obstructions

- ➔ Risk of time and cost implication
- ➔ Claims and endless arguments



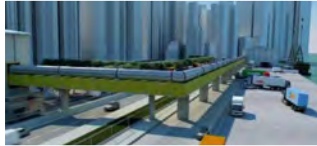
Congested utilities
(1 km road => 50 km utilities in urban areas)

MTR Corporation 2011/1/24 Page 16

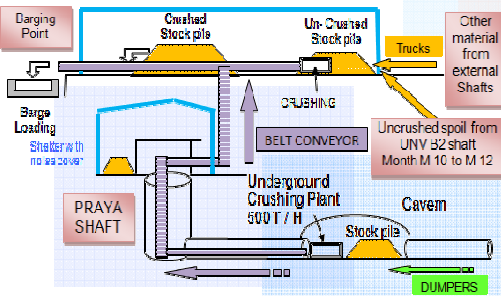


Environmental Concerns

Noise and dust mitigation



Specially built noise enclosure



Fully enclosed conveyer belt system



Water as blast ballast

MTR Corporation

2011/1/24

Page 17



Relationship among Employer, Government, Consultants & Contractors







Partnering

Improve procurement practices to facilitate delivery of construction projects **on time, within budget** while adhering to **quality** standards

Participants in a project work together more effectively and efficiently

Promote **innovative and non-confrontational** project delivery


"Guidelines on Partnering"
published by CIC in Aug 2010

MTR Corporation 2011/1/24 Page 22

Key Success Factors


Key Success Factors

- Recruitment & Training**
 - Mitigate labour shortage, aging & skill mis-match problems
- Emphasis in Safety Performance**
 - Promote safety culture & practices
- Flexibility & Adaptability**
 - Innovation & improvement in construction methods
 - Overcome technical challenges by adopting new technologies
- Partnering**
 - Develop collaborative relationship in achieving win-win project outcomes

MTR Corporation 2011/1/24 Page 24 

Ready for the Opportunities & Challenges?

MTR Corporation 2011/1/24 Page 25 



THANK YOU

Free Market and Construction Industry Development
Ir Billy Wong Wing-hoo, JP
General Manager, Henderson Land Development Co. Ltd., HK

Free Market & Construction Industry Development

Definition

An Economic System in which prices and wages are determined by unrestricted competition between businesses, without government regulation or fear of monopolies.



Hong Kong Government Policy on Free Market

- Promote a free market economy with little government intervention.
- No restrictions on investments inward and outward.
- No foreign exchange control.
- No nationality restrictions on corporate ownership with the exception of the territorial broadcasting industry.
- Consistently rated the world's freest market by the Heritage Foundation and Fraser Institute of Canada.



Hong Kong Commitments in GATT & WTO (World Trade Organization)

- Become a separate contracting party to the General Agreement on Tariffs and Trade (GATT) in 1986.
- Founding Members of the World Trade Organization (WTO) on January 1995.
- Become Member of Customs Cooperation Council (Subsequently renamed the World Customs Organization) in 1987.
- Firm supporter of the multilateral trading system.
- Adheres to GATT principles of non-discrimination and most-favored-nation treatment.
- Full commitments in GATT, with no exception for
 - (1) construction and related engineering services and
 - (2) architectural and engineering services.
- Hong Kong is more liberalized in construction field than other neighboring countries.
- Open bidding for public works has been adopted over the last century.



Rules & Regulations for Participation of Foreign Contractors and Professionals

- HK agreed to the WTO Agreement on Government Procurement (GPA) on 20 May 1997.
- Maintains an open and non-discriminatory public procurement system.
- HK has no legal or institutional restriction on foreign contractors in public or private construction markets.
- Foreign contractors subject to the same set of laws, rules and regulations as local contractors.
- Hong Kong Construction Association membership open to both local and foreign contractors.
- Foreign Contractors inclusion in Government's lists of approved contractors only need to fulfilling the same financial, technical and managerial criteria as domestic contractors, plus substantiated by consul or trade commission.



Impact of Unification of Hong Kong with China in 1997

- Removed the political uncertainty factor.
- Kick off “One Country , Two System” framework.
- With Asian Financial crisis impacting infrastructure development.
- Hong Kong continue with traditional openness to trade and foreign investment.
- Maintains an open and non-discriminatory public procurement system.
- No constraints on repatriation of profits or foreign exchange.
- Mainland China & Hong Kong continue to operate as two separated entity under WTO.



Mainland / Hong Kong Closer Economic Partnership Arrangement (CEPA)

- To promote joint economic prosperity and development of the Mainland and HK.
- Facilitates economic links between the two sides and other countries.
- Progressively reduce or eliminate tariffs and non-tariff barrier on substantially all the trade in goods.
- Progressively achieve liberalization of trade in services through reduction or elimination of substantially all discriminatory measures.
- Promote trade and investment facilitation.
- CEPA V liberalization measures include mutual recognition of construction industry professional qualifications and professional examination in various disciplines.



Challenges to Our International Competitiveness

- Globalization of economics.
- Mainland's opening up policy.
- Mainland's rapid economic growth.
- World wide government's economic policy migrate from interventionism and protectionism to market economies.
- Hong Kong's traditional advantage as a free market economy over other places is gradually diminishing.
- Branding as a free market has lost its uniqueness.



Benefit of Free Market

Impact on economy

- Free market runs on supply & demand avoiding extortion & monopoly.
- Free market negates formation of cartel amongst contactors and suppliers, provides a more healthy construction industry
- People are paid more fairly on their quality of work.
- Produce more goods at lower price, affordable to everyone and provides better living standard.
- Offers continual innovation.
- Free market ultimately leads to better products.
- Procures globally will provide opportunity to secure best price for products & services.
- Foreign capital drawn in spent on construction leads to GDP Growth and increases in employment.

Technology Transfer

- Late 1940s, skills and capital brought in by immigrants from Mainland China, especially from Shanghai to HK.
- Many foreign firms and Shanghai Construction Company (Paul Y, Hsin Chong, Sun Fook Kong, John Lok, Ngo Kee etc.) relocated their offices from Shanghai to Hong Kong. The Shanghai construction companies brought in advanced construction technology contributing to a rapid growth in Hong Kong construction industry.
- 1950s, Shek Kip Mei Multi-storey reinforced concrete buildings Resettlement Estate were built after the big fire of squatter settlement marked
 - the commencement of Government's mammoth public housing program
 - the beginning of the high rise buildings.

- 1960s, higher income led to introduction of first private housing estate Mei Foo Sun Chuen in Hong Kong and the largest development in the world at time of completion. (99 Tower complex accommodating 60,000 people in 13,500 apartments)
- Mid 1970s, MTRC Commenced Construction - first appearance of International Contractor, advance tunneling and civil engineering technology were imported.
- 1980s, due to economic boom and population expansion, real estate in both public and private sectors took a rapid upswing, pre-cast construction was introduced in public housing.

- 1990s New Airport Core Projects - more advance and /or proprietary technology were adopted to construct the ten mega size complex project
 - such as the construction of the Tsing Ma 6 lanes double deck suspension bridge and Ma Wan 6 lanes double deck cable-stayed bridge serving vehicles and the Airport Express Rail.
 - Hong Kong benefit from foreign imported capital and instant construction technology/techniques.
 - Lead to fast grow and development of construction industry.
 - Opportunity to upgrade its construction management system, safety & quality management system to international standard.
 - Hong Kong is now exporting construction services to other places such as Mainland China, Macau, Middle East etc.



Drawback of Free Market

- Some HK Companies may not be able to have a share during the booming period but could suffer from high cost of inflation.
- Free market is market driven that runs on supply and demand and cannot be planned in advance, when demand are small in the free market, the construction industry will suffer tremendously like a few years ago.



Construction Personnel

- Closed Labour Market
- 1970s - 1990s
Construction Industry relied on influx of new immigrants from Mainland China.
- The New Airport Core Projects and 85,000 units had geared up HK construction industry of maximum output in later 1990s.
- Winding down of New Airport Core Projects, 911 terrorist attack follow by SARS and Bird Flu Pandemic in early 2000s, HK construction market shrunk considerably resulting in huge unemployment rate in construction industry.
- Skilled workers left the industry for other service sector jobs.

- Without new comer, aging of existing workers will further worsen the imbalance of supply & demand of construction workers for the already started 10 large scale infrastructure projects.
- Lack of construction workers in next few years will lead to
 - higher construction cost
 - longer construction programme
- The HK government has reserved HK\$100 million in government's budget for training of construction workers and collaborating with Construction Industry Council (CIC) and the industry in implementing various training schemes and programs in meeting the imminent labour shortage issue.


Conclusion

- Consistently rated the world's freest market by the Heritage Foundation and Fraser Institute of Canada.
- Hong Kong is more liberalized in construction field than other neighboring countries.
- Foreign contractors subject to the same set of laws, rules and regulations as local contractors.
- Hong Kong continue traditional openness to trade and foreign investment after return sovereignty to Mainland China.
- Hong Kong enjoys economic growth and rapid construction technology advancement under the free market.

Construction Industry Development - a Hong Kong perspective

Prof. Mohan Kumaraswamy


The University of Hong Kong, HK




HONG KONG
Symposium
CIDCA
Construction Industry Development - Comparison and Acceleration

***Construction Industry Development –
a Hong Kong perspective***

**Prof. Mohan Kumaraswamy
Dr Gangadhar Mahesh
Mr. Scott Pu**



1



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Outline of the Presentation

- Background
- Overview of research project
- CIRC recommendations
- Main initiatives and overview
- based on each major thrust
- Key common threads
- Residual concerns and changing priorities
- Conclusions




Image from <http://aedas.com>






Image from <http://pland.gov.hk>



2



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Background

- HK Construction Industry in late 90's:



Image from <http://icac.org.hk>



Image from <http://bechtel.com>

- Pressures to re-examine priorities (e.g. for 'fast-build') and protocols/procedures and practices following a few scandals and visible general shortcomings

- Asian Financial crisis

- Awareness of industry improvement initiatives in UK and other countries

- Expectations following return of Hong Kong to China



3



Background Continued



- 'Construction Industry Review Committee' led by Henry Tang – CIRC Report (Jan. 2001):

- 109 recommendations with a vision of:

“an integrated construction industry that is capable of continuous improvement towards excellence in a market-driven environment”

- Government to become a best practice client, a facilitator and a regulator in driving the change programme while enabling industry participants to develop a culture of continuous improvement



4




Research Overview

Aim:

- Independent assessment of **Industry Improvement trajectories** - following (but not limited to) CIRC recommendations

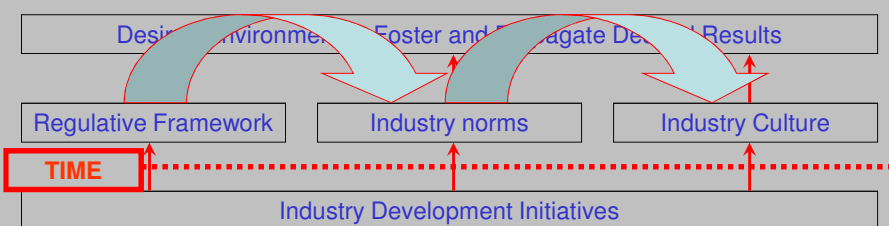
Overall Objectives summary:



- To evaluate **effectiveness** of industry improvement programmes **against original objectives**
 - while allowing for (i) **inherent industry development trends** that may have continued without reform inputs and (ii) **changing aspirations, priorities and concerns**
- To unravel **reasons** for any perceived shortfalls in above implementation and unearth any **root causes**
 - with particular reference to relevant **public agencies and private organisations**
- To **learn lessons** - to help to improve **future industry development agendas** and re-align **current development trajectories**

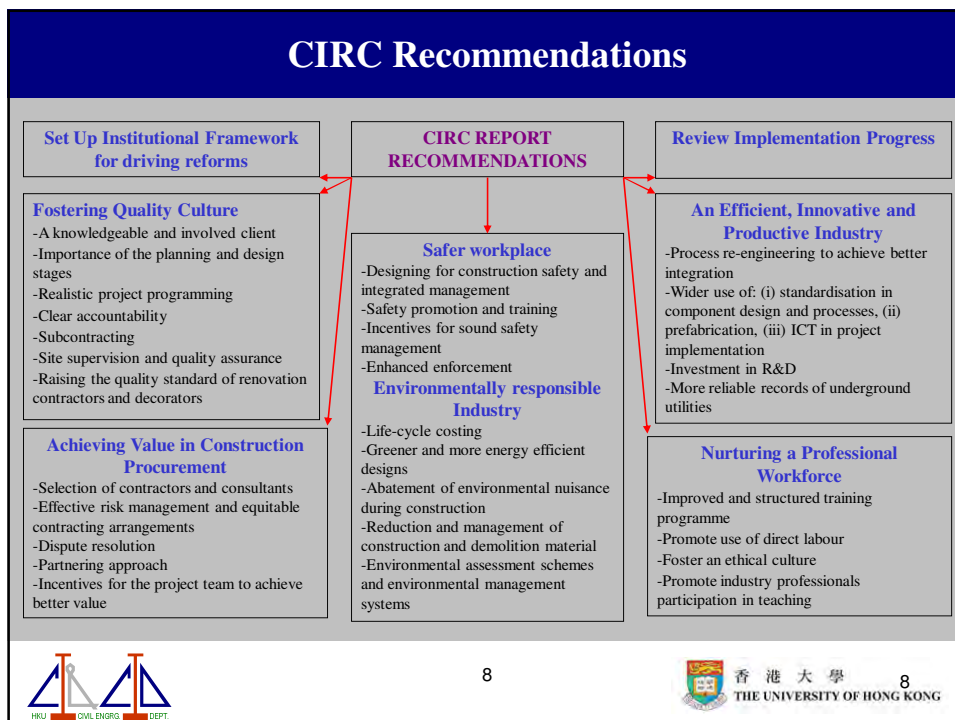
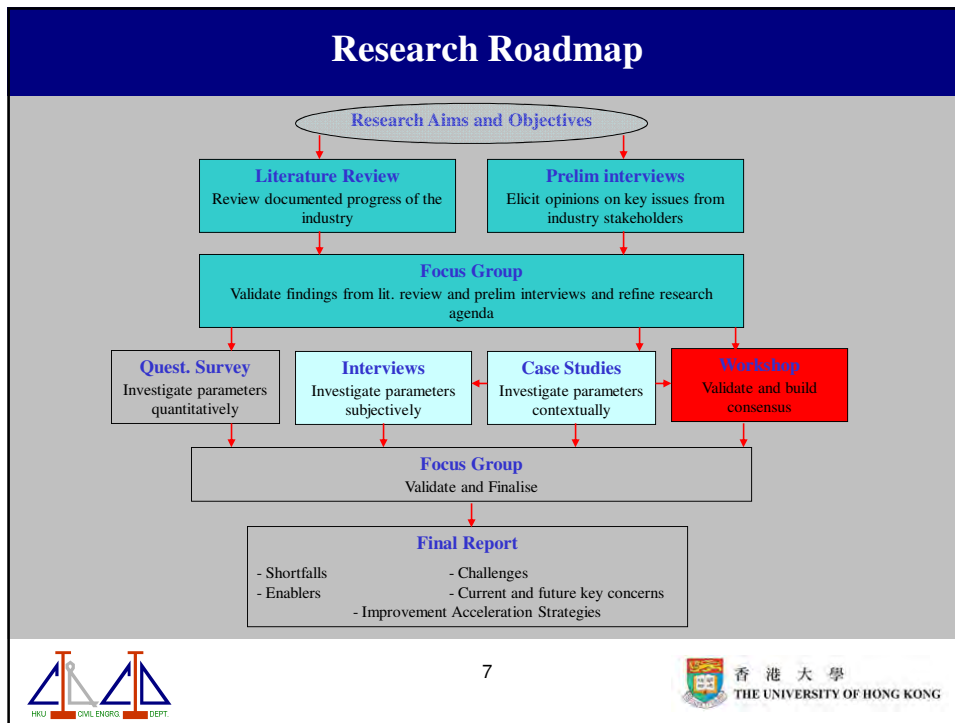

5


Research Philosophy

- Industry development initiatives depend on stakeholder institutions for implementation
- Institutional behaviour is influenced by prevalent (1) regulative framework, (2) industry norms and (3) culture - **Three Pillars of Institutional Theory**
- Industry development initiatives should trigger changes in above three 'pillars' to influence desired institutional behaviour
- Regulation is (in this context) usually a last resort and the aim of the regulation should be to shape the industry norms and culture appropriately




6




Institutional Framework (Overview)

Proposed Co-ordination Framework for Local Construction

- CIC as an independent industry coordinating body - corner stone of the institutional set up
- Has provided both pace and focus
- No regulatory power ('teeth') by itself
- Functions & Results require earning and retaining respect from industry; **and hence** retaining independence

Source: CIRC Report 2001

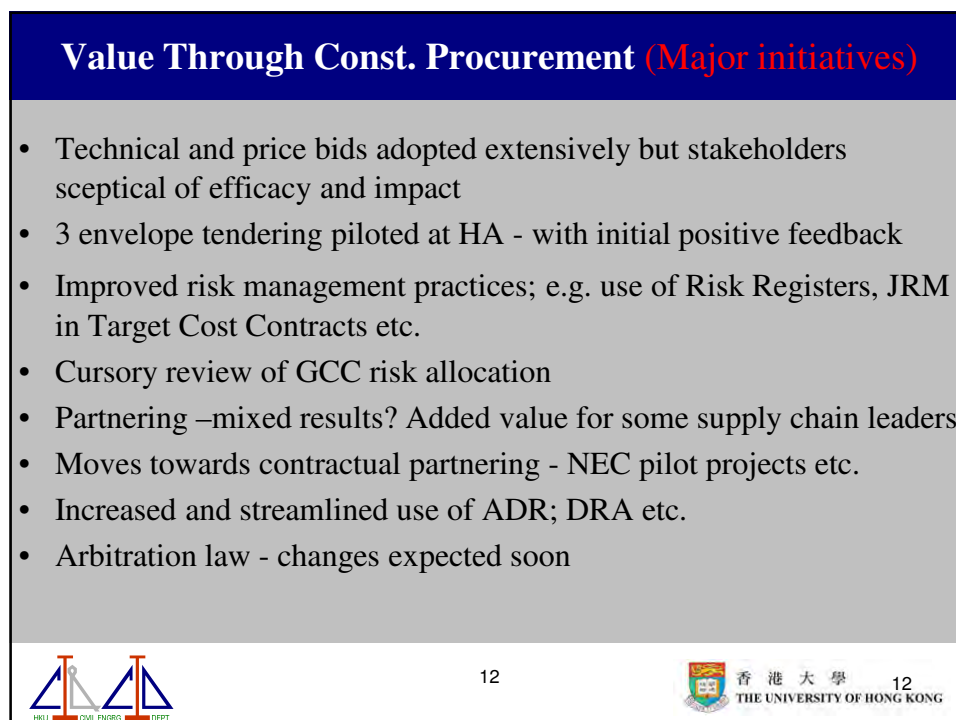
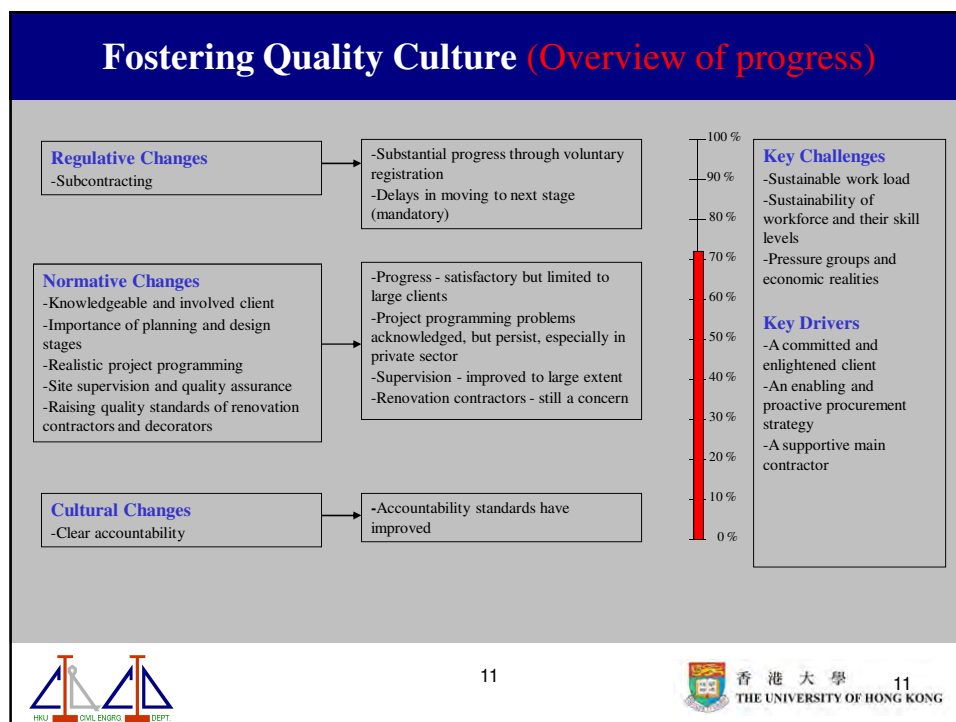
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Fostering Quality Culture (Major initiatives)

- Factors impacting quality culture
 - Subcontracting
 - Sustainable workload
 - Workforce skills
 - Unrealistic project programming
- Major initiatives
 - Voluntary Subcontractor Registration Scheme (VSRS)
 - Mandatory Worker Registration (CWRA)
 - Workforce training (CITA)
 - Minor works contractor registration
 - Enhanced site supervision in public sector

Image from <http://news.gov.hk>

10



Value Through Const. Procurement (Overview of progress)

Regulative Changes
-Dispute resolution

→ -Progress in use of ADR
-Arbitration law changes expected soon

Normative Changes
-Selection of contractors and consultants
-Effective risk management and equitable contracting arrangements

→ -Alternative procurement methods tested primarily as pilot projects in public sector and for complex projects in pvt. sector; not in extensive use.
-Technical and price bids adopted extensively in public sector but, stakeholders sceptical of impact
-Review of GCC conditions was cursory
-Improved risk management practices

Cultural Changes
-Partnering approach
-Incentives for the project team to achieve better value

→ -Partnering delivers some value on some projects, but limited to leading players and stakeholders
-Incentive initiatives - present but not widely prevalent

Key Challenges
-Public sector procurement constraints
-Tender selection methodology
-Industry culture

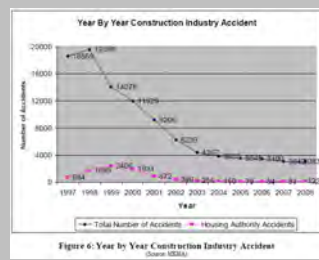
Key Drivers
-A committed and enlightened client
-Incentives to stakeholders
-Equitable contracting arrangements

13

Workplace Safety (Major initiatives)

- Pay for safety
- CIC published guidelines on site safety; - e.g. for working in hot weather, safety of tower cranes etc
- Site safety award schemes
- Safety linked performance incentives in individual projects
- Improved working conditions - e.g. access to drinking water, resting areas etc.

14



Environmentally Responsible Industry (Major initiatives)

- Pay for environment and pay for waste management schemes
- Voluntary energy efficiency registration scheme launched 2001
- now mandatory through Buildings Energy Efficiency Ordinance (2010)
- Establishment of HK BEAM ratings and HK Green Building Council
- Environment and conservation fund
- Biannual energy efficiency awards scheme
- Energy efficiency labelling scheme
- Moves towards life cycle costing and carbon footprint reduction

Source: SB08 report Hong Kong

15

Workplace Safety & Environmentally Responsible Industry (Overview of progress)

<p>Regulative Changes</p> <ul style="list-style-type: none"> -Enhanced enforcement -Safety promotion and training -Environmental assessment schemes and environmental management Systems -Charge for waste disposal 	<ul style="list-style-type: none"> -Clear progress over last decade, reduction in accidents -Clear emphasis on safety regulations -Substantial progress in environmental management systems and assessment schemes
<p>Normative Changes</p> <ul style="list-style-type: none"> -Life-cycle costing -Greener and more energy efficient designs 	<ul style="list-style-type: none"> -Significant improvement in work place conditions -Slow progress in lifecycle costing approach -Green initiatives growing and expected boost from Govt. assessment schemes -Boost from Green Building Council
<p>Cultural Changes</p> <ul style="list-style-type: none"> -Incentives for sound safety management -Abatement of environmental nuisance during construction -Reduction and management of construction and demolition material 	<ul style="list-style-type: none"> -Pay for safety - success story that needs to be replicated in Pvt. Sector -Award schemes - clear incentive -Progress in pollution control and waste management practices

Key Challenges

- Work place conditions especially in small sites
- Reduction of cost for alternative green technologies
- Existing building upgrades

Key Drivers

- Payment or incentives (including recognition) for safety and green initiatives
- Worker training and proper planning
- Integration of construction and maintenance activities

16

Nurturing a Professional Workforce (Major initiatives)

- Streamlined role of CITA under CIC for workers training
- On-job training in association with CITA by leading companies
- Subsidies for training
- Curriculum redevelopment and orientation towards industry requirements
- Industry image improvement - e.g. in worker facilities; uniforms



Image from <http://123rf.com>



Image from <http://corbisimages.com>

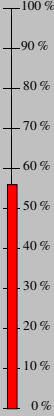


17



Nurturing a Professional Workforce (Overview of progress)

<p>Regulative Changes</p> <p>-Improved and structured training programmes</p>	→	<p>-Progress - workers registration scheme</p> <p>-Curriculum development in progress</p> <p>-Upgrading skills of old age workers and attracting youth to bolster workforce - significant problem</p>
<p>Normative Changes</p> <p>- Promoting use of direct labour</p>	→	<p>-Slightly improved but far from satisfactory</p>
<p>Cultural Changes</p> <p>-Fostering ethical culture</p> <p>-Promoting industry professionals participation in teaching & training; and progressive inputs from academia</p>	→	<p>-Targeted through training and guidelines</p> <p>-Reliant on Professional institutions and Universities</p>




100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%

Key Challenges


- Attracting new talent into workforce
- Training cost absorption
- Aging work force

Key Drivers

- Improving industry image
- Incentives for skills upgrading
- On-job training



18



Efficient, Innovative & Productive Industry (Major initiatives)

- Performance based procurement selection e.g. PASS linked Tendering at HA
- Enhanced ICT usage e.g. BIM
- Innovation and performance linked incentives e.g. as in TC/GMP contracts, Bonuses for early completion etc.
- Investment in R&D under CIC e.g. carbon labeling framework for construction materials
- Improved prefabrication systems e.g. volumetric prefabrication at HA
- Export potential exploitation

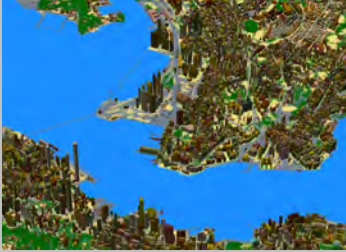


Image from <http://rmsi.com>






Image from housingauthority.gov.hk



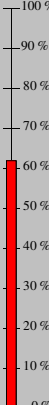
19



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Efficient, Innovative and Productive Industry (Overview of progress)

Regulative Changes -Facilitating regulators	-Standard codes updated - ongoing -Numerous and Fragmented statutory bodies - an issue
Normative Changes -Process re-engineering to achieve better integration -Wider use of: (i) standardisation in component design and processes, (ii) prefabrication, (iii) ICT in project implementation -Investment in R&D -More reliable records of underground utilities	-Integrated procurement piloted but not prevalent -Improvement in standardisation and use of prefabrication -ICT in project implementation picking up but not prevalent -Information accessible but accuracy is a problem -Investment in R&D is ad hoc and needs streamlining
Cultural Changes -Tap export potential of the industry	-HK developing as a strong contender for 'preferred' arbitration venue in Asia




Key Challenges
 -Streamlining and expediting approvals
 -Upgrading workforce skill sets
 -Quality assurance in offsite manufacturing

Key Drivers
 -Incentivising innovations
 -Streamlining R&D investments
 -Shared costs of ICT implementation



20



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Mandatory Vs Voluntary

- Mandatory (Regulative) initiatives have found more traction and success in implementation
- Voluntary initiatives propagation through guidelines/ best practices are still limited to industry leaders

Public Vs Private

- Some reforms may be easier to implement in public sector
(given large share of public sector projects)
- Public sector more driven by extrinsic pressures towards reforms (subject to constraints), while private sector prefers intrinsic 'pressures'
- Private sector (except for leading developers and contractors) - slow in joining initiatives



21



Role of Professional Institutions and Trade Assns.

- Fragmentation is still rampant; but improved with CIC emerging as a common platform
- Clear role in:
 - Reform formulation
 - Reform propagation
 - Encouraging members to buy into reforms
 - Regulating member's behaviour
- Satisfactory in participation, but clear shortfalls in propagation
- Shortfalls in updating their charters and codes to align to rapidly changing industry environment and culture



22



Implementing Reforms in Projects, Organisations and Industry

- Easier to deliver normative and cultural changes in project environment than organisational and industry environment
 - Selling a reform is the key in **organisation and industry** settings
 - Buying into the reform is the key in **project** settings
- Top-down approach - better for capital intensive initiatives & innovations
- Bottom-up approach - better for incremental changes
- Consensus and commitment is essential for industry-wide reforms



23



Residual Concerns

- Failure to cross-pollinate industry improvement initiatives across public to private sector **and** vice-versa
- Lukewarm response to improvement initiatives which are voluntary
- Inertia/ difficulties in improving industry norms and culture; hence **over reliance** on regulatory changes
- Inequitable risk allocation practices
- Inadequate workforce training provisions
- Difficulties in improving image of the construction industry
- Payment security



24



Changing Priorities

Figure 1: Year by Year Construction Value
Source: Construction & Miscellaneous Services Statistics Section, Census and Statistics Department

- Rise of Maintenance sub-sector
 - Minor works contractors registration scheme
 - Sectoral capacities of workforce and organisations???

- Demand stability
 - Sharp infusions of investment
 - Long term sustainability???
 - Export of construction services???

Figure 2: Government Expenditure on the Capital Works Programme
Source: Legislative Council Panel on Development, March 30, 2010
Forecasted figures

25

Changing Priorities

- Urban renewal requirements
- Increased emphasis on social and economic aspects of sustainability

- Aging workforce
- Inability to attract fresh talent
 - Image of the industry
 - ?

26

Key Concerns and Issues

- Sustainable workload
- Improved image of the industry
- Attracting new entrants to work force and upgrading skill sets of existing workforce
- Protecting local industry
- Payment security
- Speedy dispute resolution (Amendments to arbitration clause)
- Regulating renovation contractors
- Sustaining alternative procurement initiatives
- Promoting cross pollination of industry improvement initiatives



27



Key Ingredients for Structural Change

- Key requirements for **strategic** structural changes in the industry are sustainable workload and a strategic vision
- Strategic vision:
 - What kind of an industry does Hong Kong want?
 - How should the industry visualise itself in terms of where it should be in say, 20 years from now?
 - What should be the 'right' size of the industry?
 - What are the current priorities and what is the long term outlook?
- Industry development initiatives must align with the answers to the above questions



28



Conclusions

- Overall progress is satisfactory
- Clear shortfalls in workforce nurturing and fostering innovations
- Sustainable workload is a root cause for many shortfalls
- Public sector quick on the uptake of initiatives, but short on following up and full implementation
- Private sector enthusiastic, but slow in embracing cost intensive and potentially ‘risky’ changes
- Need to revisit, re-establish and pursue vision based on changing priorities, anticipated long term trends and strategic objectives



29



Thank You!

Centre for Infrastructure and Construction Industry Development

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30



Developing the Construction Industry in Singapore

Prof. George Ofori

National University of Singapore, Singapore



DEVELOPING THE CONSTRUCTION INDUSTRY IN SINGAPORE



Professor George Ofori
Dr Evelyn Teo
Dr Imelda Tjandra

Developing the Construction Industry in Singapore



Overview of the Presentation

- Introduction
- Overview of the Research
- Construction 21 Report
- Progress Since C21
- The Way Forward
 - Demand Stability
 - Public vs. Private Sector
 - Globalisation
 - Subcontracting
 - Construction Workers
 - Performance Measurement
 - Information Technology
 - Sustainability
- Conclusions




Singapore Flyer
Image from <http://www.traveljournals.net>




Marina Barrage
Image from <http://www.news.gov.sg>

Developing the Construction Industry in Singapore


 National University of Singapore
 Department of Building


Introduction

- Construction industry in Singapore has faced major challenges over the past decade, especially declining and rapidly rising activity levels, and their consequences.
- Transformation mainly achieved via government efforts; its...
 - understanding of industry’s strategic importance
 - commitment to nurture strong, competitive industry.
- Industry, through professional institutions, trade associations, also played a role.
- C21 Report has been a blueprint for developing Singapore’s construction industry.
- As programme draws to its end, it is pertinent to assess its achievements and industry’s continuing challenges.
- So what next? What is the future for the construction industry in Singapore?




3

Developing the Construction Industry in Singapore



 National University of Singapore
 Department of Building

Overview of the Research


A Decade of Change and Improvement? Construction Industry Development Programmes in Hong Kong, Singapore and United Kingdom



UK, 1998



Singapore, 1999



Hong Kong, 2001

- Sir John Egan’s *Rethinking Construction*, inspired similar reviews in Singapore in 1999 and Hong Kong in 2001.

4


Developing the Construction Industry in Singapore			
<h2 style="text-align: center;">Overview of the Research</h2> <h3 style="text-align: center;">A Decade of Change and Improvement? Construction Industry Development Programmes in Hong Kong, Singapore and United Kingdom</h3>			
	Vision	Strategic Thrusts	Time Frame
UK Egan Report 1998	“A modern construction industry (the need for a new way of working, such as lean production, standardisation, partnering)” “Adoption of the model of performance improvement that other industries have followed with such success”	Five key drivers of change: 1. Committed leadership. 2. A focus on the customer. 3. Integrated processes and teams. 4. A quality driven agenda. 5. A commitment to people.	10 years
Singapore Construction 21 1999	“To be a world class builder in the knowledge age”	1. Enhancing professionalism of industry. 2. Raising the skills level. 3. Improving industry practices and techniques. 4. Adopting an integrated approach to construction. 5. Developing an external wing. 6. Collective championing effort for construction industry.	5-10 years
Hong Kong Construct for Excellence 2001	“An integrated construction industry that is capable of continuous improvement towards excellence in a market-driven environment”	1. Fostering a quality culture. 2. Achieving value in construction procurement. 3. Nurturing professional workforce. 4. Developing an efficient, innovative, productive industry. 5. Improving safety and environmental performance. 6. Devising a new institutional framework to drive the industry. 7. Implementation of a change programme for industry.	2-5 years

5

Developing the Construction Industry in Singapore	
<h2 style="text-align: center;">Overview of the Research</h2> <h3 style="text-align: center;">A Decade of Change and Improvement? Construction Industry Development Programmes in Hong Kong, Singapore and United Kingdom</h3>	
<ul style="list-style-type: none"> • Worthwhile to compare implementation of change programme in Singapore with those in Hong Kong and UK which had a common aspiration. • The 3 jurisdictions have common industry structure, practices, thus, useful to... <ul style="list-style-type: none"> – ascertain how (differently?) each has developed. – paint a scenario with possible “meeting points” which can be drawn upon. – consider possible common lessons. 	

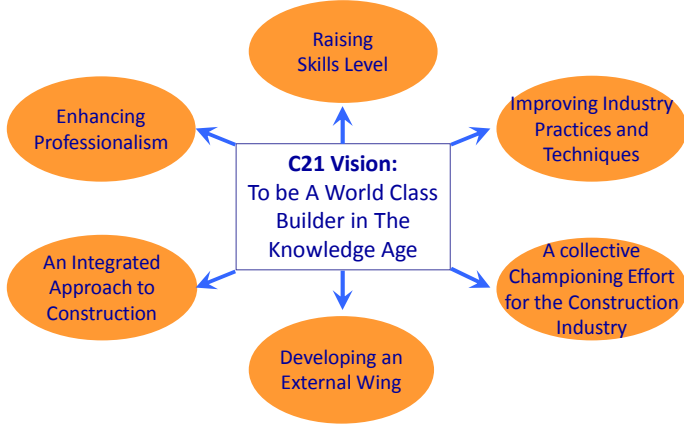
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Developing the Construction Industry in Singapore


 National University of Singapore
 Department of Building

Construction 21 Report

- C21 gave 39 recommendations, 6 strategic thrusts, 2000-2010.




```

    graph TD
        Vision["C21 Vision:  
To be A World Class  
Builder in The  
Knowledge Age"]
        Thrust1("Raising Skills Level")
        Thrust2("Improving Industry Practices and Techniques")
        Thrust3("A collective Championing Effort for the Construction Industry")
        Thrust4("Developing an External Wing")
        Thrust5("An Integrated Approach to Construction")
        Thrust6("Enhancing Professionalism")
        
        Vision --> Thrust1
        Vision --> Thrust2
        Vision --> Thrust3
        Vision --> Thrust4
        Vision --> Thrust5
        Vision --> Thrust6
    
```

- Radical transformation to turn industry from one which is “dirty, dangerous, demanding” (3D) to “professional, productive, progressive” (3P).

7

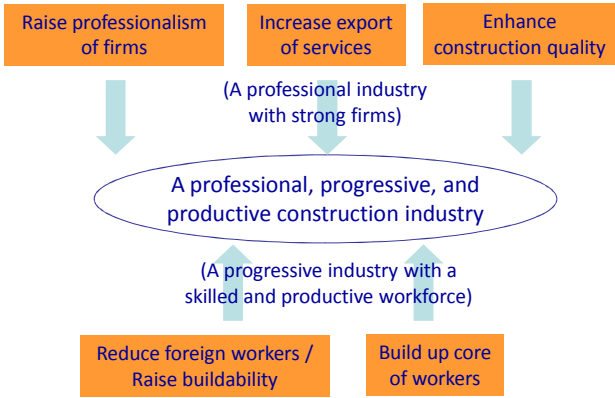
Developing the Construction Industry in Singapore


 National University of Singapore
 Department of Building

Construction 21 Report

Mid-Term Review

- Refined C21 vision with five strategic thrusts, 2005-2015.



```

    graph TD
        Thrust1["Raise professionalism of firms"]
        Thrust2["Increase export of services"]
        Thrust3["Enhance construction quality"]
        Thrust4["Reduce foreign workers / Raise buildability"]
        Thrust5["Build up core of workers"]
        
        Thrust1 --> Vision
        Thrust2 --> Vision
        Thrust3 --> Vision
        Thrust4 --> Vision
        Thrust5 --> Vision
        
        Vision["A professional, progressive, and productive construction industry"]
        
        Vision --- Label1["(A professional industry with strong firms)"]
        Vision --- Label2["(A progressive industry with a skilled and productive workforce)"]
    
```

8

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Progress Since C21

- Range of progressive practices encouraged by C21.
 - CORENET: most successful; one factor that led Singapore to be ranked first in the world in ease of doing business (International Finance Corporation, The World Bank Group, 2010).
 - CONQUAS.
 - Buildability.
 - Continuing Professional Development (CPD) programme.
- However, some recommendations have not been implemented.
 - Codes of conduct: drafted, but it was so general that it was not necessary anymore.
 - Construction (Design and Management) Regulations: In progress.



Image from <http://crisisandchildren.ipsnewsasia.net>

9

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Progress Since C21

- Some C21 initiatives and programmes have not succeeded.
 - Intention to reduce the number of foreign workers.
 - Man-Year Entitlements (MYE): It has been tightened and restored, some unexpected practices have developed; limit might not be tight enough.
 - Maintainability study: It has been launched, yet not been much used in industry.
 - National Productivity and Quality Specifications (NPQS): Launched, yet has not been pervasively used.
 - Construction Management System: A web-based application was completed in 2004, but it did not take off in industry.
 - Standardisation of contracts: No common contract yet.
 - Multidisciplinary firms.



10

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Progress Since C21

- Dirty, Demanding, Dangerous (3Ds) → Professional, Productive, Progressive (3Ps).
 - Much progress, but degree of progression was not as much as it should have been.
- Issue of foreign workers is main concern for many people in industry.
- Impact of C21 on the way the firms work:
 - Construction projects have become more complex.
 - More time is required for projects, from inception to completion.
 - Construction projects have become more expensive to complete.
 - There is greater risk involved in construction projects.


but...

 - Firms can better manage construction projects.
 - The quality of building has improved.

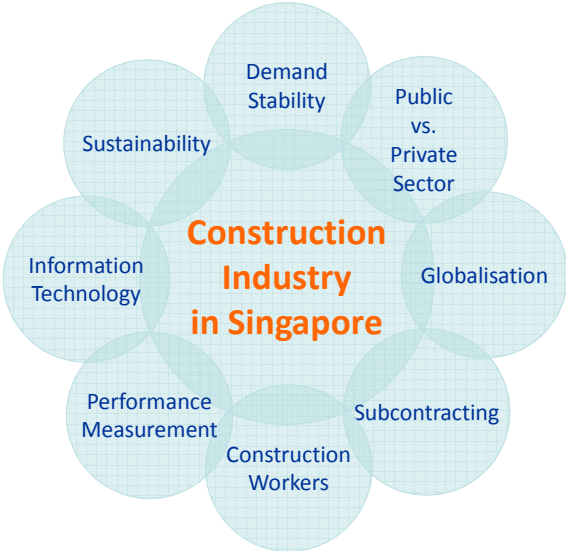


11

Developing the Construction Industry in Singapore




The Way Forward



12

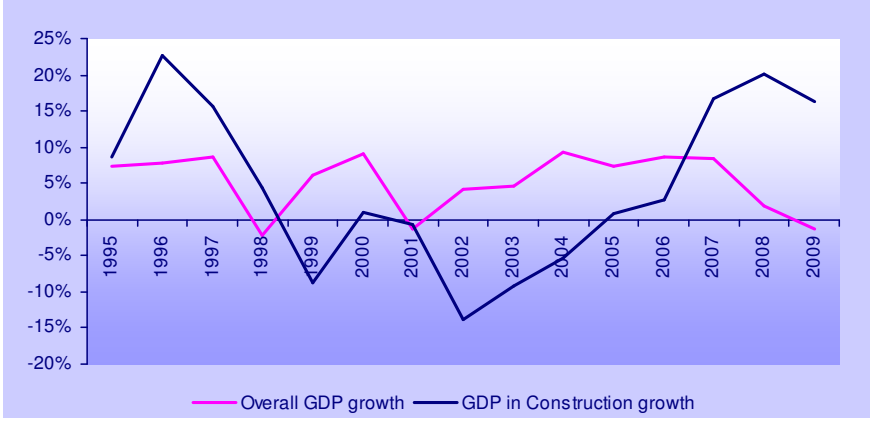
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The Way Forward

Demand stability

- Despite the global economic downturn, construction demand remained strong in 2009.



Year	Overall GDP growth (%)	GDP in Construction growth (%)
1995	7.5	8.5
1996	8.0	22.5
1997	8.5	16.0
1998	0.0	5.0
1999	6.0	-8.0
2000	9.0	1.0
2001	0.0	-1.0
2002	4.0	-14.0
2003	4.5	-10.0
2004	9.0	-5.0
2005	7.5	1.0
2006	8.5	3.0
2007	8.5	16.5
2008	2.0	20.0
2009	-1.0	16.0

GDP growth and value added in construction, 1995-2009
 Source: Department of Statistics (2006, 2009, 2010)

13

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The Way Forward


Demand stability

- Projected Singapore GDP growth of 13-15% in 2010.
- Government will continue to play an active role, by deferring or releasing projects depending on construction cycle → bulk of construction demand will come from public sector.
- Sustained level of construction demand over the next 2-3 years.



14

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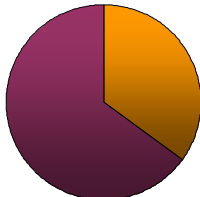
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The Way Forward

Public vs. Private Sector

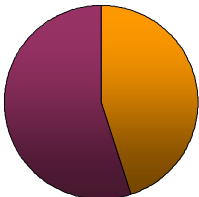
- BCA estimated value of construction contracts to be awarded:
 - 2010**: S\$21 – 27 billion.
 - 65% of which will be from the public sector.
 - 2011 and 2012**: S\$18 – 25 billion (annually).
 - 55% of which will be from the public sector.

2010



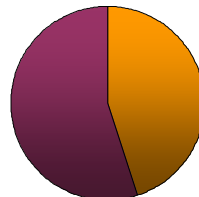
■ Private sector ■ Public sector

2011



■ Private sector ■ Public sector

2012



■ Private sector ■ Public sector

15

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The Way Forward

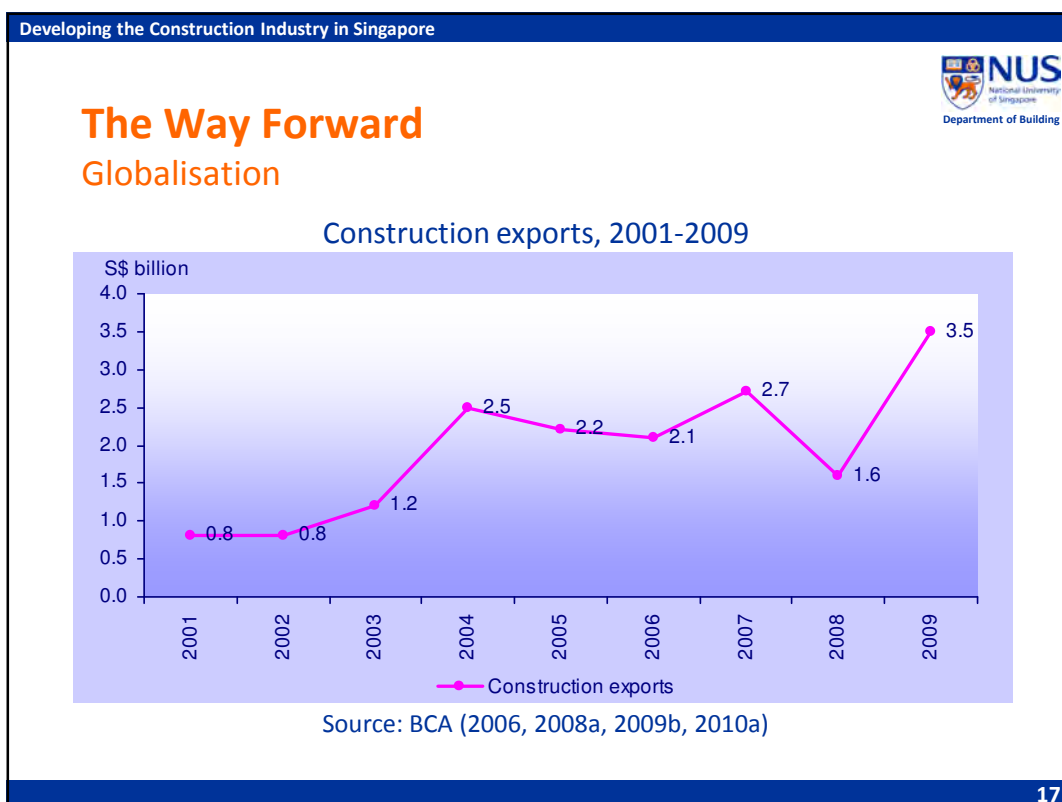
Globalisation

- Level of construction activity in Singapore will not be sufficient to enable local construction and construction-related firms to grow.
- Singapore construction firms must export their services in order to thrive, or even survive.



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16



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- ## The Way Forward
- ### Subcontracting
- Registration and licensing.
 - The Singapore Lists of Trade Subcontractors (SLOTS).
 - Construction Registration of Tradesmen (CoreTrade).
 - A registration scheme for skilled and experienced personnel in various key trades.
 - Objective: to build up a core group of competent and experienced workers.
 - Licensing of contractors (including subcontractors).
 - All builders require a Builder's Licence.
 - They must meet minimum standards of management, safety record and financial solvency.
 - Objective: to raise professionalism among builders.
- 
- 18

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The Way Forward

Construction Workers

- Singapore's small population.
- Poor image of construction.
- Inability to attract many Singaporeans.
- Set of initiatives and incentives to increase the proportion of skilled workers among the industry's workforce.
 - MYE → what is the appropriate level?
 - Training → is it adequate?
 - Levy system.
 - Long-term work passes.

Reliance on foreign workers




Image from The Straits Times

19

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The Way Forward

Performance Measurement - Quality

- CONQUAS.
 - has been refined over the years.
 - has been extended to Quality Mark for residential buildings.
- National Productivity and Quality Specifications (NPQS).
 - has not been pervasively used.
 - currently being revamped, involving a number of professional institutions.



Image from <http://www.griffithsandarmour.com>

20

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The Way Forward

Performance Measurement - Productivity


- Buildability has helped to improve productivity; moves now towards constructibility.
- S\$250 million Construction Productivity and Capability Fund (CPCF).
 - Part of national drive to raise productivity and foster a productive workforce and workplaces.
 - Initiatives to help local contractors develop capabilities in areas such as complex civil engineering and building projects, to invest in new technologies, and upgrade to a higher quality workforce.



Image from <http://www.topnews.in>

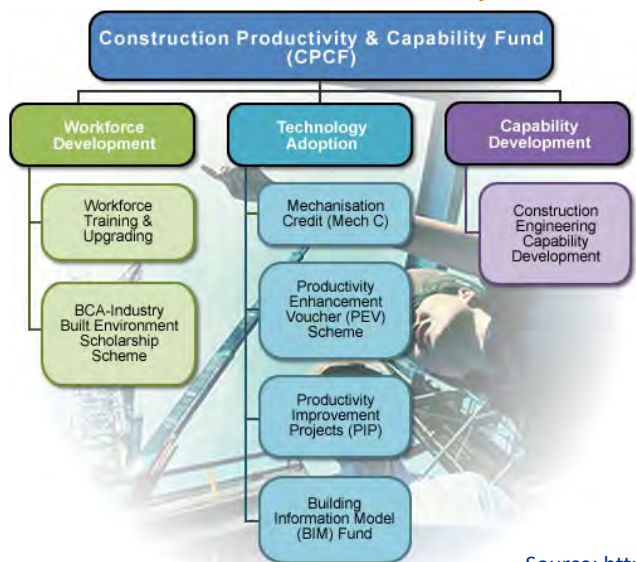
21

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The Way Forward

Performance Measurement - Productivity




```

    graph TD
      CPCF[Construction Productivity & Capability Fund (CPCF)]
      subgraph Workforce_Development [Workforce Development]
        W1[Workforce Training & Upgrading]
        W2[BCA-Industry Built Environment Scholarship Scheme]
      end
      subgraph Technology_Adoption [Technology Adoption]
        T1[Mechanisation Credit (Mech C)]
        T2[Productivity Enhancement Voucher (PEV) Scheme]
        T3[Productivity Improvement Projects (PIP)]
        T4[Building Information Model (BIM) Fund]
      end
      subgraph Capability_Development [Capability Development]
        C1[Construction Engineering Capability Development]
      end
      CPCF --- Workforce_Development
      CPCF --- Technology_Adoption
      CPCF --- Capability_Development
    
```

Source: <http://www.bca.gov.sg>

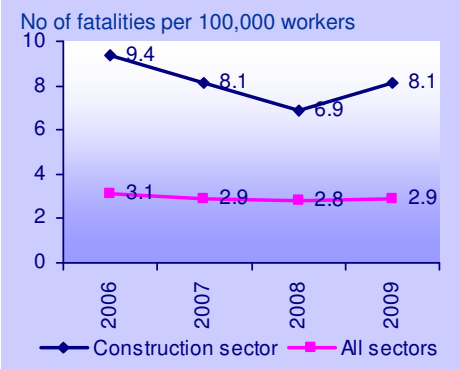
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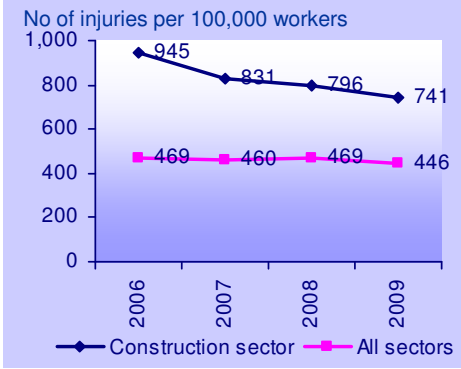
The Way Forward

Performance Measurement - Health and Safety



Year	Construction sector	All sectors
2006	9.4	3.1
2007	8.1	2.9
2008	6.9	2.8
2009	8.1	2.9

Accidents in the construction sector by fatality rate compared to all sectors, 2006-2009
Source: WSH Council (2010)




Year	Construction sector	All sectors
2006	945	469
2007	831	460
2008	796	469
2009	741	446

Accidents in the construction sector by injury rate compared to all sectors, 2006-2009
Source: WSH Council (2010)

23


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The Way Forward

Performance Measurement - Health and Safety

- Towards zero injury in construction sector:
 - Occupational Safety and Health (OSH) Framework – 10 March 2005.
 - Workplace Safety and Health Act (WSHA) – 1 March 2006.
 - Workplace Safety and Health Council (WSH Council) – 1 April 2008.
 - “Implementing WSH 2015 for Construction Industry” – 2007.
 - “Implementing WSH 2018 for Construction Sector in Singapore” – April 2010.



24

The Way Forward

Performance Measurement - Health and Safety

- Specific action plans to improve WSH standards in the construction sector:
 - Building strong capabilities to better manage WSH.
 - Individual, corporate, and industry levels.
 - Developing a performance-based regime.
 - Include designers and developers in the regulatory framework, setting industry standards.
 - Promoting the benefits of WSH and integrating WSH into business.
 - Driving improvements through large organisations, assessments of safety and health management systems.
 - Creating and building partnerships.
 - Co-ordination of work, industry-led taskforces.



25

The Way Forward


Information Technology

- Construction Real Estate Network (CORENET) systems:
Design → Procure → Build → Maintain
 - Information services.
 - Integrated submission.
 - IT standards.
 - Integrated plan checking systems → government agencies worked together to deliver a single plan-checking tool to check building plans for compliance with various regulations. Any areas of non-compliance can be detected and amended during design phase than during approval phase, resulting in less re-submission.



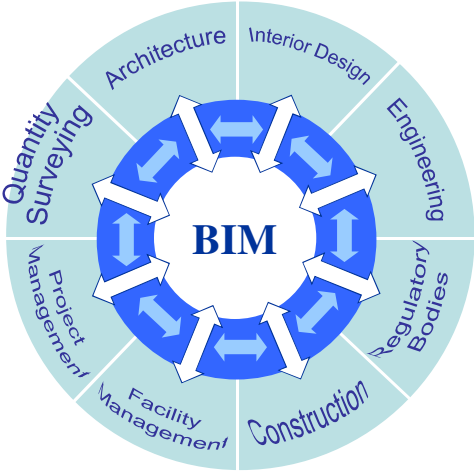
26

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The Way Forward Information Technology

- Building Information Model (BIM) - a platform to facilitate integration of knowledge in design and construction, and handing over to facilities management.
- Tools to help designers and contractors anticipate design problems during early stages of a project, minimising unnecessary work during construction phase.



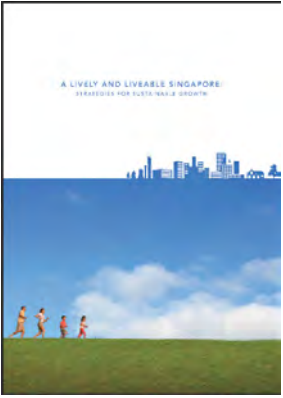
27

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The Way Forward Sustainability

- Sustainable Blueprint – April 2009:
 - to improve resource efficiency in energy, water and waste management;
 - to enhance the physical environment through controlling pollution, increasing greenery as well as cleaning and beautifying water bodies;
 - to engage the community and encourage them to play their part; and
 - to build up technologies and capabilities in order to realise sustainable development targets, spur economic growth and export expertise.



28

The Way Forward Sustainability

- Green Mark for Buildings Scheme – January 2005.
 - Platinum, Gold Plus, Gold, Certified.
 - Benchmarking of a building’s environmental performance.
 - Basis for further research and the development of a design guide for green buildings.
 - As of June 2010: 350 buildings have made the Mark.
- 1st and 2nd Green Building Masterplans.
- Research focus in green building technologies.
- Awards to encourage the adoption of green initiatives.
 - Green Mark Award – 2005
 - Green Mark Champion Award – 2008
 - Green and Gracious Builders Award – 2009

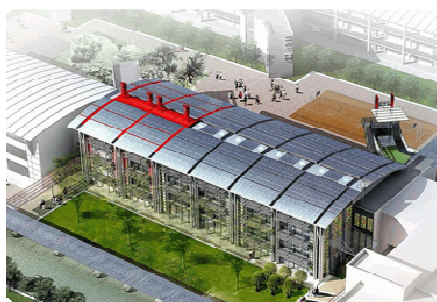


The Way Forward Sustainability



Cube 8

Image from <http://www.bca.gov.sg>



Zero-Energy Building @BCA Academy

Image from <http://www.mnd.gov.sg>

GREEN MARK PLATINUM AWARD WINNERS 2010



Sky Terrace @Dawson

Image from <http://www.bca.gov.sg>

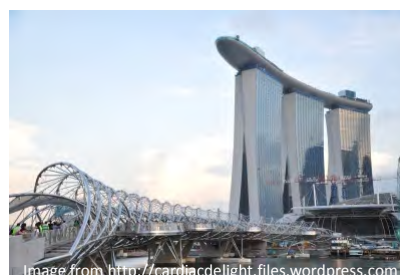
Conclusions

- Singapore has made much progress in developing its construction industry, but the extent to which the industry reforms have fulfilled their original intentions is not fully clear.
- There is a need to revisit priorities and review the progress so far.
- It is important to draw lessons from changes in industry's environment and structure.



Conclusions

- The future of construction industry development in Singapore:
 - A sustained level of construction demand over the next 2-3 years.
 - The bulk of the projects will come from the public sector.
 - Construction firms must export their services to survive.
 - Continued reliance on subcontracting. Focus on registration and licensing.
 - Foreign workers are here to stay, hence a long-term solution is needed.



Conclusions

- The future of construction industry development in Singapore:
 - Improvement in quality must be accompanied by more efficient design and sustainability consideration.
 - Focus on improving productivity as part of national drive.
 - Improvement in Health and Safety, towards zero injury.
 - Use of BIM as a platform to facilitate the integration of knowledge in design, construction, and facilities management.
 - Emphasis on sustainable development in new and existing buildings and infrastructure.



thank you.

Construction Sector Reform in the UK

Prof. Stuart Green

University of Reading, UK

Construction Sector Reform in the UK

Professor Stuart Green
Dr Chung-Chin Kao

University of Reading, UK

18 January 2011 (Hong Kong Symposium)

Introduction

- Current discourse of industry improvement focuses on the Egan Report (1998).
- Latham (1994) accredited with 'paving the way for Egan'.
- Debate assumes the construction sector was previously under-achieving.
- Recurring problems: poor quality, lack of modernisation, adversarial culture, client dissatisfaction, fragmentation.
- *Rethinking Construction* pointed towards the need for a new way of working.

Rethinking Construction (1998)

- Exhortation to learn from other industries
- Emphasis on lean production, standardisation and partnering.
- Promotion of key performance indicators (KPIs).
- Movement for Innovation (M4I) establishes programme of best practice 'demonstration projects'.
- Strategic Forum for Construction formed in 2001 to oversee the industry reform movement.

Follow-on reports

1. ***Achieving Excellence (1999)*** - Office of Government Commerce
2. ***Modernising Construction (2001)*** - National Audit Office
3. ***Accelerating Change (2002)*** - Strategic Forum for Construction
4. ***Construction Commitments (2008)*** - Strategic Forum for Construction
5. ***Construction Matters (2008)*** - Business and Enterprise Select Committee
6. ***Never Waste a Good Crisis (2009)*** - Constructing Excellence

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4 Key Reports Review



1998



2002



2008



2009

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Rethinking Construction - summary

Drivers for Change

- Committed leadership
- Focus on the customer
- Product team integration
- Quality driven agenda
- Commitment to people

Improving the Project Process

Product development	Partnering the supply chain
Project implementation	Production of components

Targets for Improvement

- Capital cost -10%
- Construction time -10%
- Predictability +20%
- Defects -20%
- Accidents -20%
- Productivity +10%
- Turnover & profits +10%

Recurring themes

- A target-driven approach to performance measurement
- Integrated projects teams, integrated supply chains
- Collaborative working
- Client leadership
- Training and qualification
- Health and safety
- Standardisation and prefabrication
- Application of ICT

A review of progress (2009)

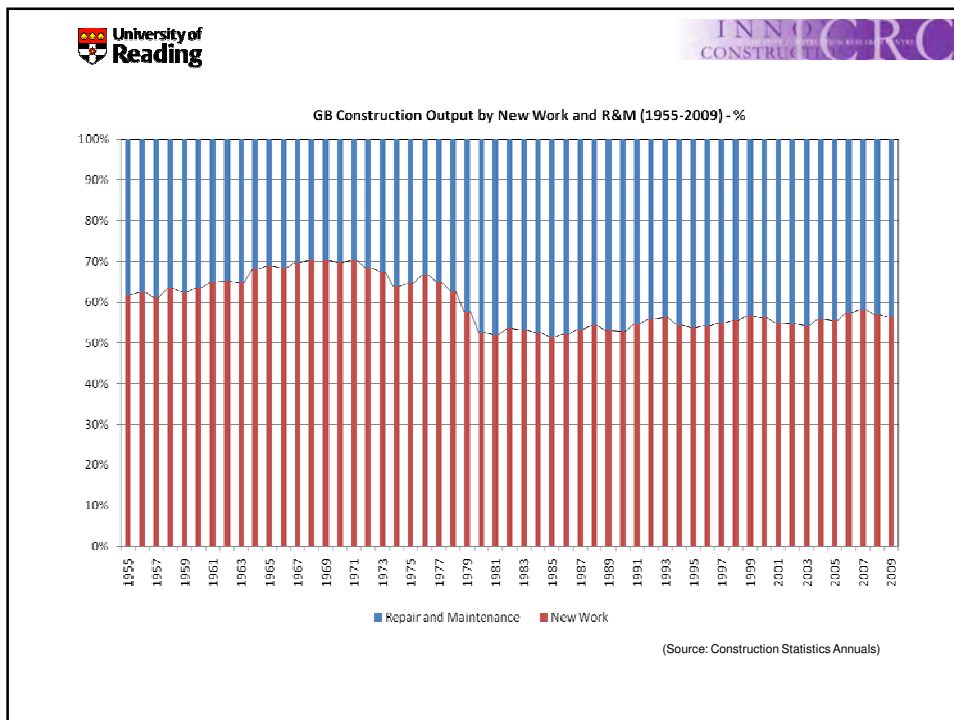
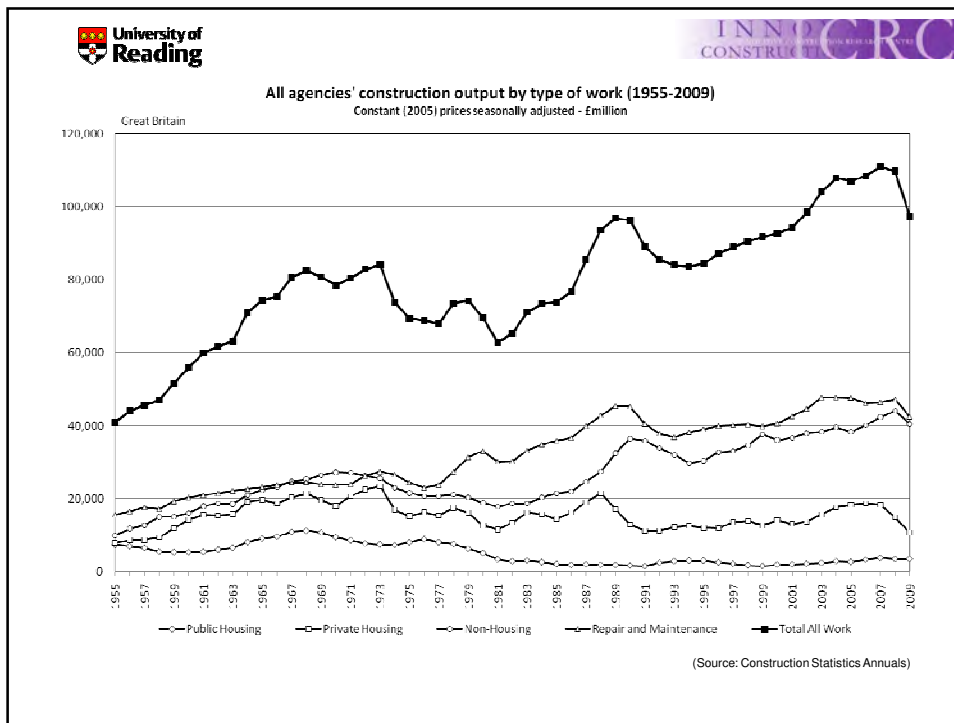
- Stated aim of *Rethinking Construction* has not been achieved.
- Not enough evidence of a united resolve to meet the vision.
- Commitments tend to be superficial and expedient, not tangible and sustainable.
- The Egan targets have not been met, only safety and productivity show reasonable progress.

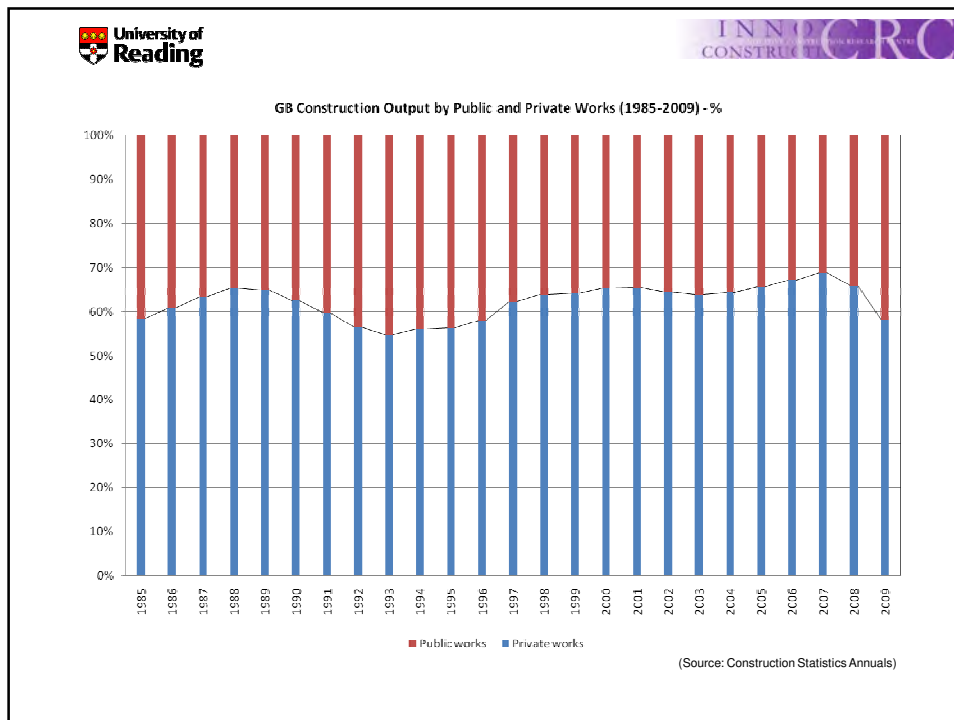
Change and Continuity in the UK Construction Sector

Industry change

- “When rain falls on the desert it will inevitably follow the course of existing wadis. If we focus our attention too much on the rain, we will fail to understand the terrain upon which it falls.”







Structural flexibility

- Emergence of the ‘hollowed-out’ firm.
- Increased reliance on subcontracting.
- Proliferation of procurement methods: design-and-build, management contracting, construction management.
- Growth in self-employment from 30% in 1975 to 50% in 1995.

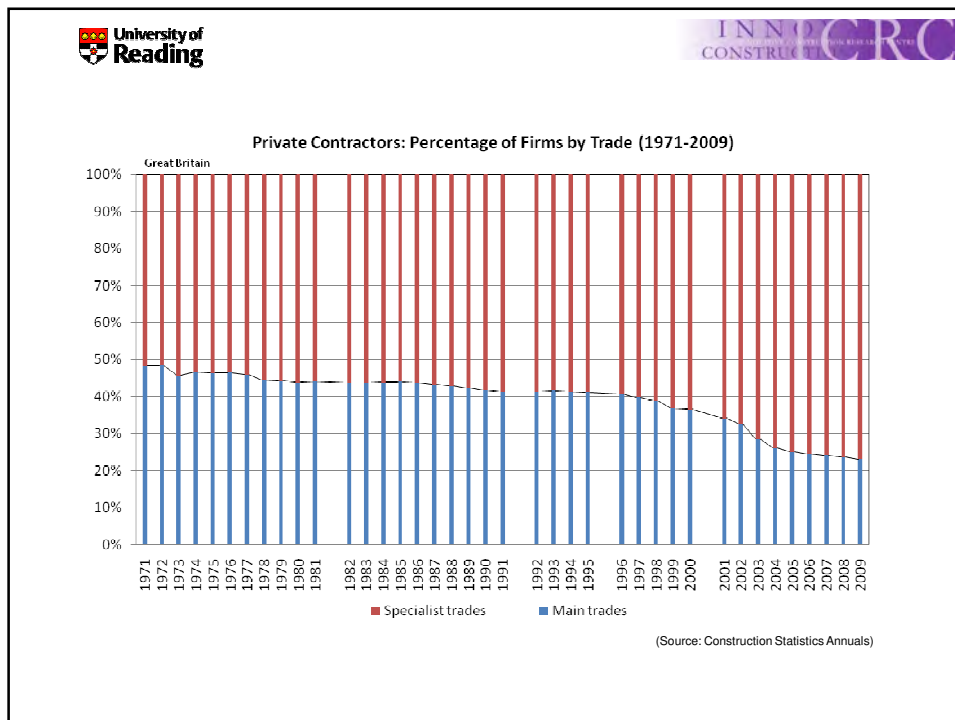
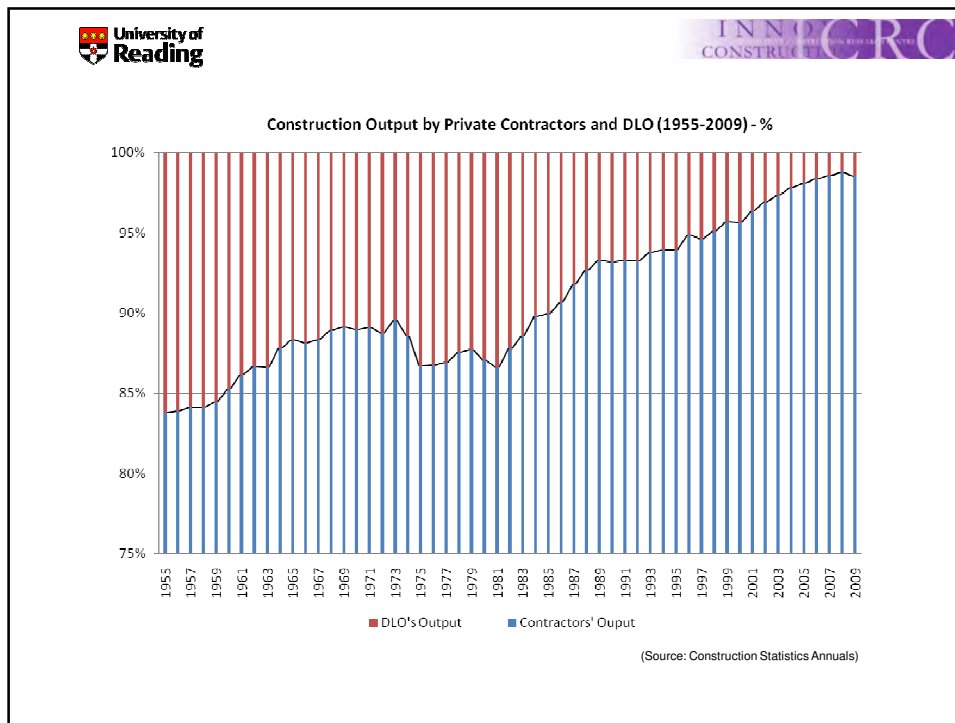
Privatisation and outsourcing

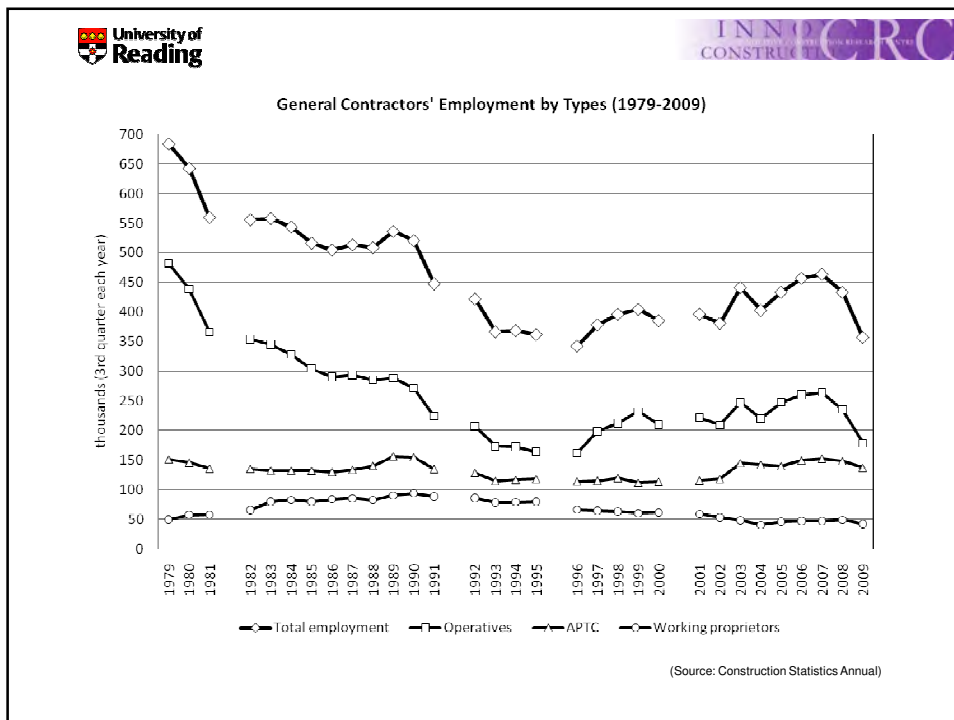
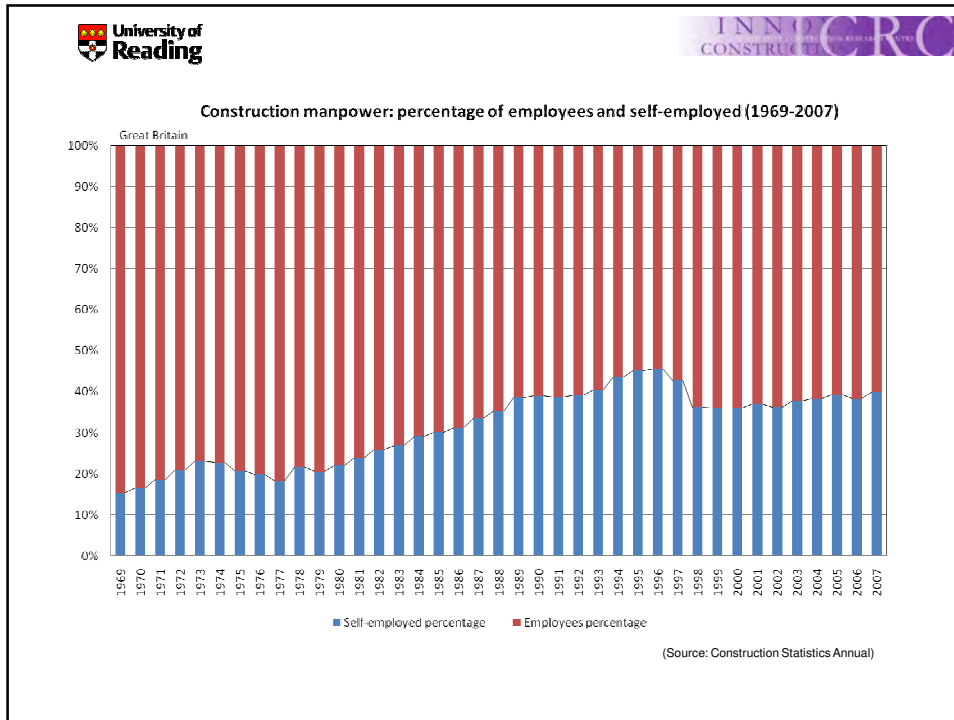
- Extensive privatisation throughout 1980s and 1990s: utility companies, British Rail, BAA, PSA.
- Retreat of government as a provider of mass housing.
- Demise of public sector Direct Labour Organisations (DLOs).
- Outsourcing strategies driven by regulatory pressures and the introduction of yardstick competition.
- Compulsory Competitive Tendering (CCT), 'Best Value', PFI/PPP

Public housing completions (1946-2008)



(Source: Housing and Planning Statistics 2009)





Implications

- No ‘mutuality of responsibility’ between government and industry.
- Prioritisation of unregulated enterprise over planned stability.
- Incentivisation of self-employment through tax and national insurance system.
- Fragmentation of skills and deregulated labour markets.

Industry views

- Egan KPIs seen to be only relevant for marketing purposes.
- Current recession re-emphasised the importance of structural flexibility.
- Globalisation of supply chains– entirely unpredicted by Egan.
- Increased societal concern vis-à-vis sustainability; contractors struggling to make sense of complex agenda.
- Generic improvement recipes less important than localised learning across networks.

Conclusions

- Debate remains focused on instrumental improvement measures.
- Absence of contextualisation.
- Egan report did not initiate change, but legitimised and reinforced changes which were already happening.
- Discourse of integration sits ill-at-ease with fragmented employment contexts.
- Improvement initiatives provide sensemaking narratives which bolster the self-identity of industry practitioners.