A Review on the Recent Large Scale Infrastructure Projects in Hong Kong

Part I
A general understand and Review of the scope and nature of Infrastructure Developments in Hong Kong
General Classification of Infrastructure Development/Projects

1. Transportation facilities including highway and railway projects
2. Port and Airport development projects
3. Land formation projects (previous Aldrich Village, Choi Wan site formation)
4. New Town development projects
5. Environmental and Sewage projects
6. General urban facilities including water and power supply
7. Other strategic development (Cyberport, Disney Land Theme Park, West Kowloon Cultural District)

Formation of the Shatin New Town in the late 1970s
Shatin in 2000
Formation of Tuen Mun New Town in the early 1980s

Development along Tuen Mun-Yuen Long Corridor
Formation of Tai Po New Town in the early 1980s and an aerial view of the district as seen in 2000

Tolo Harbour Highways in late 1990s
Ma On Shan and Tolo Harbour in early 2000s

Chronological milestones

1995 – 2000

- Opening of the Lantau Link (Tsing ma /Kap Shui Mun Bridge) and the North Lantau Expressway (1997)
- Opening of the Western Harbor Crossing & West Kowloon Expressway (97)
- Completion of Container Terminal 5 – 8 (98)
- Development of Tung Chung New Town (98)
- Opening of Chek Lap Kok Airport (98)
- Opening of the MTR Tung Chung Line and Airport Railway (98)
- Opening of the Route 3 including the Ting Kau Bridge and Tai Lam Tunnel (98)
Chronological milestones (continue)

2000 onward

- Opening of the MTR Tseung Kwan O Extension (2002)
- Opening of the KCR West Rail (03)
- Opening of the KCR East Rail Extension – Ma On Shan Line (04)
- Opening of the KCR East Rail Extension – Hung Hom to Tsim Sha Tsui (04)
- Completion of Container Terminal No. 9 (04)

Infrastructure Development in general aims to achieve the following basic objectives

1. Provide new lands for the required developments.
2. Provide a land structure with the basic physical constituents able to support or accommodate the provision of the required facilities, quality living of the inhabitants and the sustainability/development of all essential social or economical functions.
3. Provide the transportation linkage within or outside the territory for the efficient operation of various functions.
4. Provide the hardware facilities to achieve the objectives
Specific objectives for Hong Kong’s development (as stipulated by the Planning Department in the Territorial Development Strategies and its revision visioned toward 2030)

1. Enhance HK as an international city and a region centre for business, finance, information, tourism and manufacturing.

2. Ensure provision to satisfy land use and infrastructure needs arising from various strategized sectors.

3. Conserve and enhance significant landscape, ecological attributes and heritage features.

4. Enhance and protect quality of overall environment

5. Provide framework to develop a multi-choice, high capacity, environmentally acceptable transport system for efficient and safe movement of passengers & goods.

6. Able to be implemented by public and private sectors to cater for resources and market demand. In addition to the revised objects for 2030, it further reiterates

7. Provide a good quality living environment through
   - conserving natural landscape,
   - preserving cultural heritage,
   - enhancing townscape
   - regenerating old urban areas
   - meeting various housing and community needs

8. Strengthen link with Mainland to cope with growth.
Major Infrastructure Development projects since 1990

1. Airport Core Projects
2. Strategic/General highway projects
3. Strategic railway projects
4. Strategic developments to enhance the overall economic structure of Hong Kong

Constituents of the Airport Core Projects

1. New Airport at Chek Lap Kok
2. Tung Chung New Town
3. North Lantau Expressway
4. Airport Railway
5. Lantau Fixed Crossing
6. Route 3 (Kwai Tsing Section)
7. West Kowloon Reclamation
8. West Kowloon Expressway
9. Western Harbour Crossing
10. Central Reclamation
Major Highway projects completed since 90s

1. Tsuen Wan/Shatin Connection (Route 5, including Shing Mun Tunnel, 1990)
2. Kwun Tong Bypass (1991)
4. Improvement/Widening of Tuen Mun Highway (1996)
5. Hung Hom Bypass and Princess Margaret Road Link
6. Route 3 (Country Park Section, including Tai Lam Tunnel, 1998)

7. Tsing Yi North Coastal Road (2001)
8. Improvements to Island Eastern Corridor section between North Point Interchange and Sai Wan Ho (2003)
9. T7 roadwork (Ma On Shan Bypass, 2005)
10. Deep Bay Link and Shenzhen Western Corridor (2007)
11. Widening of Castle Peak Road from Tsuen Wan to Siu Läm (2007)
12. Route 8, Stonecutter to Shatin (2008)
Geographical map of Hong Kong

Major Highway Systems (Highway Strategic Network)
Major Recent Railway Projects

1. MTR Quarry Bay Congestion Relief project (1997 – 2001)
7. West Island and South Island Lines (2009 – 2013)
Railway Networks according to the Railway Development Strategy 2000 (supplemented by major infrastructure developments under CE 2007 Policy Address)

1. Shatin to Central Link – linking Tai Wai Diamond Hill, Kowloon City, Hung Hom, Wanchai to Central

2. Kowloon Southern Link – linking East Rail and West Rail at south between TST Station & Nam Chong Station (West Rail)

3. Northern Link – linking the East Rail and West Rail of KCR at the north between Sheung Shui to Pat Sheung

4. Regional Express Link – provide a non-stop railway link between the city and the border at Lo Wu

5. Island Line Extension – an extension at the north shore of the existing Island Line to relief the existing line traffic

6. Port Rail Line – an extension from the East Rail to enhance cross boundary freight services (frozen)
Alignment of the Northern Link and Regional Express Line

- Island Line
- Shatin to Central Link
- Kowloon Southern Link
Infrastructure Projects of other natures

2. Large-scale sewage works (e.g. Strategic Sewage Disposal Scheme (SSDS)/Harbour Area Treatment Scheme (HATS), 1998 – 2003)
3. Water Supply project (e.g. construction of a 13km aquaduct from Lai Chi Kok to Tai Po for the laying of a series of water mains (1997 – 2000))
4. Storm water and flood control

Procuring Agents for Infrastructure Projects

1. Highway Department – highway, bridges and large-scale roadwork
2. Civil Engineering Department – land formation, reclamation, port and marine works, environment improvement works
3. Territory Development Department – Airport Core Projects, New Town Development, other assignment projects similar to CE Dept.
4. Drainage Services Department – Flood control, large-scale drainage and SSDS/HATS projects
5. Water Supplies Department – large-scale water supply/distribution works (e.g. aquaduct)
Procuring Agents for Infrastructure Projects

6. Mass Transit Railway Corporation – all railway works managed/operated by the MTRC

7. Kowloon Canton Railway Corporation – all railway works managed/operated by the KCRC

8. Airport Authority – projects related to the construction of the new airport in Chek Lap Kok

9. Other Franchised Organizations (in BOT projects), for example:
   • Tate’s Cairn Tunnel
   • Eastern Harbour Crossing
   • Western Harbour Crossing
   • Tai Lam Tunnel

Part II

Detail understand of some major Infrastructure Developments – Airport Core Projects
Airport Core Projects include:
1. New Airport at Chek Lap Kok
2. Tung Chung New Town
3. North Lantau Expressway
4. Airport Railway
5. Lantau Fixed Crossing
6. Route 3 (Kwai Tsing Section)
7. West Kowloon Reclamation
8. West Kowloon Expressway
9. Western Harbour Crossing
10. Central Reclamation
Airport Core Projects – approx. costs

1. Airport – $65B, including formation of the airport island ($22B) and the construction of the Terminal Building ($15B)
2. Tung Chung New Town – $6B
3. North Lantau Expressway – $10B
4. Airport Railway – $28B
5. Lantau Fixed Crossing – $12B, including the construction of the Tsing Ma Bridge ($7.2B), Ma Wan Viaduct and Kap Shui Mun Bridge ($1.6B).

6. Route 3 (Kwai Tsing Section) – $10B, including the construction of the Cheung Tsing Tunnel ($0.8B) and a 6.5km elevated expressway ($2.2B)
7. West Kowloon Reclamation – $6B
8. West Kowloon Expressway – $8B
9. Western Harbour Crossing – $6B
10. Central Reclamation – $4B

Total costs for the Airport Core Project around $155B as in 1997 price
New Airport at Chek Lap Kok

Formation of the Airport Platform from the original Chek Lap Kok Island
Modulated roof for the Terminal Building

Construction of the Air Bridge
The new Airport close to its completion
Other facilities in the New Airport
Ground Transportation Centre

Transport connection including expressway and airport railway
Other facilities owned by the Government

Air Cargo Facilities – Asian Air Terminal (left)
Formation of the Tung Chung New Town

Tung Chung taking shape as in 1997
Tung Chung taking shape as in 1997

Tung Chung in 2007
North Lantau Expressway

Original Coastline of North Lantau (section between Yam O and Tai Ho)
North Lantau Expressway – formation of the Yam O Section

Slip Road to Penny Bay (Disney Land) at Yam O
Tai Ho Section and the Depot Facilities of Tung Chung Line

Toll Plaza of the Expressway at Kap Shui Mun entrance
Lantau Fixed Crossing

The 1377m span
tTsing Ma Bridge
The Tsing Ma Bridge

Ma Wan side

Cable anchor

Tsing Yi side

Main span

Side span and approach bridge
Water Channel between Tsing Yi and Ma Wan as in 1995

Hoisting and erecting the modulated bridge deck onto the suspension cable
Exterior and interior view inside the bridge deck

The Ma Wan Viaduct – the linking section between the Tsing Ma and Kap Shui Mun Bridge
Kap Shui Mun Bridge – a 430m cable-stayed bridge
Route 3 – Kwai Tsing Section
Approach section of Route 3 heading to the Rambler Channel

This section of Route 3 is mainly composing of 4-lane 2-way elevated roadway, averaged 35m span and 15m above ground.
West Kowloon at Yaumatei/Shamshuipo at the early stage of reclamation

Gradual progress of Reclamation at Yaumatei
Government docks and private-owned shipyards being relocated during the reclamation process

South-most tip of West Kowloon Reclamation – connection to the harbour crossing tunnels
Reclamation at Stonecutter Island to form land for Container Terminal No. 5 to 8

Container Terminal No. 5 to 8 put into operation in early 1997
West Kowloon in 2008

West Kowloon Expressway
West Kowloon Expressway comprising:
1. North Section – Elevated, 2.7 km
2. South Section – On-grade, 1.5 km
West Kowloon Expressway at Tai Kok Tsui near Olympus Station
Western Harbour Crossing

Casting yard for the forming of the submerge tunnel tubes at Shek O Quarry
Transport the submerge-tube by barges and place them onto pre-arranged position.

Connecting the submerge-tube to the tunnel approach.
The tunnel approach and connection arrangement at Sai Ying Poon side

Associated roadwork forming the entrance concourse to the Western Harbour Crossing at Sai Ying Poon side
Western Harbour Crossing at the West Kowloon entrance
Central Reclamation
Early stage of the reclamation work in 1994

Reclamation carried out in a looped manner to allow servicing facilities to be replaced at the latest stage
Gradual completion of the reclamation for handing over for commencement of other facilities

Viewing the area in 2001 with the IFC 2 under construction
Central Reclamation (Phase I) as seen in 2007
Airport Railway

The 32km Airport Railway and Tung Chung Line owned by MTR
Hong Kong Station of the Airport Railway

Aerial view of the Central Reclamation seeing the Railway Alignment going into the Harbour Crossing Tunnel
Construction of the Kowloon Station and the cut-and-cover tunnel of the Airport Railway at its early stage in 1995
Kowloon Station as seen in 1998, the station provide vast land resources to fund the Airport Railway projects as well as for the future development of the West Kowloon

Airport Railway crossing the Rambler Channel heading to the Tsing Yi Station
Property development to finance the Airport Railway
– the International Financial Centre projects
Property development to finance the Airport Railway
- development around Kowloon and Olympus Station