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## URBAN SYSTEMS

# Recent Infrastructure Developments in Hong Kong – the Background, Current and Future Developments

Raymond W. M. Wong

## 1 INTRODUCTION

To accommodate somewhat 7 million people in a piece of land of size slightly bigger than 1050 sq km like Hong Kong is not an easy task. Needless to mention the 240 outlying islands and hilly topography that contributes to about 62% of the total land area which cut the territory into bits of almost disconnected lands.

The overall population density per sq km in Hong Kong is about 6300 in 1999. The figure conceals wide variations among different areas in the territory. The density in the metro areas is about 28000 per sq km, while in the New Territories it is around 4100. Thanks to the continual development of new towns outside the metro areas since the 70's, the difference in population density is gradually dropping in the recent years.

For the last 3 decades, growth of population is quite steady roughly at a rate of 1 million every 10 years. However, as Hong Kong has returned to the sovereignty of the People's Republic of China in 1997 that created more active social and economical interactions between people of the two places, it is expected a faster growth will be envisaged in the coming decades. As a result, more lands with acceptable infrastructure facilities have to be provided to cater for the expected growth as well as to improve existing quality of living inside the territory. This paper aims to provide a summary of what has been done in the recent years as a means of strategic improvement to the territory of Hong Kong.

## 2 THE PHYSICAL ENVIRONMENT

The territory of Hong Kong can be sub-divided into 4 main geographical regions, namely the Island of Hong Kong, Kowloon Peninsula and New Kowloon, New Territories and the outlying islands. Map as shown in Figure 1 provides a rough idea of the physical environment of Hong Kong.



**Figure 1** Physical Map of Hong Kong Special Administration Region, Public Republic of China.

The urban or metro areas are located on the northern and southern sides of the Victoria Harbour. North of the harbour is the Kowloon Peninsula, it stretches northward about 5.5 km until it reaches the east-west running Kowloon peaks (averaged 320 m high). The peninsula is a piece of relatively flat land of about 36 sq km in size.

South of the harbour is the Island of Hong Kong, which is a hilly island of about 75 sq km in size, with continual mountain ranges occupying most of the island, leaving only a narrow strip of the coastal areas being practically developable. Within what are called the metro areas with flat land less than 58 sq km altogether, it housed about 49% of the total population of Hong Kong.

North of the Kowloon peaks is the New Territories. Before the 60's, there were only some thinly populated village towns scattered all over the 650 sq km of land. The only piece of flat land (Yuen Long-Kam Tin Plain, area about 55 sq km) situated on the north-western corner of the New Territories, the rest of the areas are practically only narrow patches of flatter land located on the foot of hills and mountains. The 960 m-high Tai Mo Hill and the outward stretching mountain ranges lying almost in the middle, making access from the metro areas into the New Territories very difficult. Table 1 shows the growth in population throughout the past decades.

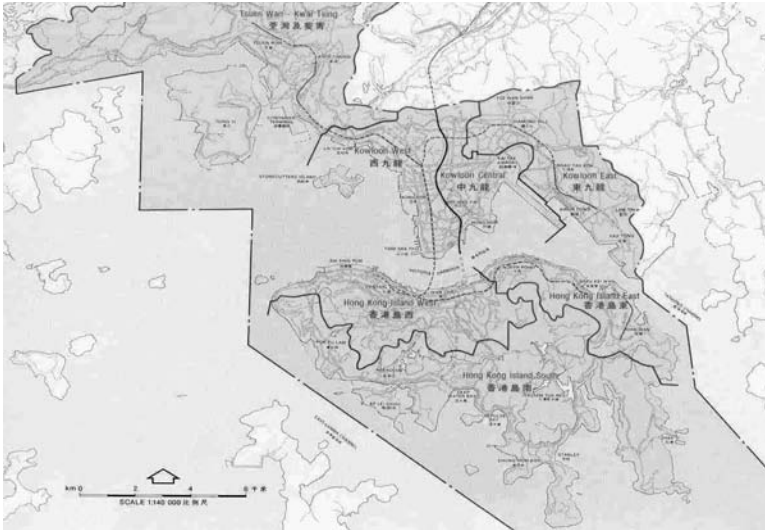
End of Year	Total Population	Population in Metro Areas*	Population in New Territories
1910	457 000	**	**
1920	625 000	**	**
1930	840 000	**	**
1960	3 133 000	**	**
1965	3 716 000	**	**
1970	3 948 000	**	**
1975	4 439 000	**	**
1980	5 021 000	**	**
1985	5 495 000	3 551 000	1 944 000
1990	5 674 000	3 381 000	2 293 000
1995	6 218 000	3 305 000	2 913 000
2000	6 720 000	3 110 000	3 610 000
* excluding Kwai Tsing and Tsuen Wan districts			
** statistic not available under regional sub-group			

**Table 1** Population Growth in the New Territories.

### 3 THE METRO AREAS

The over-saturated development and the need to thin out the metro areas in Hong Kong is unquestionable. However, as the majority of the community facilities as well as job opportunities are within the metro areas, purely extending the living room from the city into the northern territories cannot provide solutions to everything.

Due to the lack of long-term city planning strategy since the 1950's when Hong Kong was just recovering from World War II and the civil wars of China, quite a lot of developmental constraints have been undermined during the restructuring process as to improve the urban environment as a whole by today's standards. For instance, the Kwun Tong and Tsuen Wan districts, which were two "satellite towns" being developed in the early 60's, were originally designed as industrial towns where very labour-intensive manufacturing industries would be located. It was so planned that the neighbouring areas, provided with densely packed low-cost public housing, would supply the required manpower for the nearby factories. As the metro development expanded rapidly in the decades that came, these districts became a kind of cancer to the metro environment and cannot meet any loose quality standard even in development countries.



**Figure 2** Map of the Metro Area of Hong Kong.

The pace and coordination in development is another important issue. A typical example can be found in the eastern part of Hong Kong Island. Since the 50's, the eastern part of Hong Kong Island stretching from Causeway Bay to North Point, was settled with residents coming from middle-class families, or with new settlers migrated from Mainland China who had brought with them capitals after the 1949 revolution. During the economic take-off in the late 70's, the demand for housing increased drastically and the areas were rapidly developed. For a period of more than 15 years, the pace of development much out-rated the growth in public transport, thus resulting in constant congestion and serious pollution. Needless to mention the poor living environment faced by the 560,000 residents living in the district.

There is not much better in the central part of Kowloon, like the district of Tsim Sha Tsui, Yau Ma Tei, Mong Kok and Sham Shui Po. In these areas, a great amount of old buildings, the majority of which were built in the early 60's, are deteriorating rapidly and causing quite a lot of problems to a modern society. Inappropriate commercial activities like food-stalls, restaurants, retail shops, small-scale entertainment facilities, or even mini red-light zones are scattered all over the district. Owing to the complication in the property ownerships, or limitation and insufficiency in the existing control regulations, the government can do nothing to have the situation easily rectified. Urban restructuring and renewal plans on a strategic level is thus an essential process to improve the existing urban environment.

The government of Hong Kong is at present trying to achieve the urban renewal exercise through several major means. One is to thin-out the urban density by introducing more lands in closer proximity to relieve population and essential facilities in the metro area. This can be achieved by reclamation such as the West Kowloon reclamation, which was carried out between 1994 to 1997,

that provided about 3.8 sq km of newly reclaimed land for various development purposes. The second way is by the continual development of new towns with large amounts of public housing provisions to attract people in the urban areas to move in. And at the same time amendments of planning regulations will gradually be made, such as to lower the plot ratio (gross floor areas allowed to build as per unit land area) or by the introduction of other incentive provisions, in order to attract investors to redevelop the old land lots. The Land Development Council, which is a commission that represents the government on a commercial basis to redevelop deteriorating properties in the metro areas, also helps to play an important role in the urban renewal processes.

#### **4 RESTRUCTURE THE ENTIRE TERRITORY OF HONG KONG**

In views of achieving sustainable growth to meet with the modern world and to enhance the living standard of the majority, the government of Hong Kong realizes that there must be an up-to-date physical planning framework to guide the development and investment in order to ensure the efficient use of resources and to promote a high quality living and working environment. The process of strategic planning has been established in Hong Kong for many years, involving a number of reviews to take account of changing circumstances. The attitude of the government was becoming more pro-active especially after the 80's when Hong Kong had founded her prosperity in trade and finance that led her to be one of the four dragons in Asia.

The Territorial Development Strategy (TDS), in particular, provided a new framework for urban and territorial growth in Hong Kong. TDS is the highest tier in the hierarchy of town plans in Hong Kong. It provides a board, long-term framework on land use, transport and environmental matters for the planning and development of the territory. The following are the objectives as set out in the TDS.

Objective 1: To enhance the role of Hong Kong as an international city and a regional centre for business, finance, information, tourism, entrepôt activities and manufacturing.

Objective 2: To ensure that adequate provision is made to satisfy the land use and infrastructure needs arising from sectoral policies on industry, housing, commercial, rural, recreation and other major socio-economic activities.

Objective 3: To conserve and enhance significant landscape and ecological attributes, and important heritage features.

Objective 4: To enhance and protect the quality of the environment with regard to air, water quality, noise, solid waste disposal and potentially hazardous installations by minimizing net environmental impacts on the community.

Objective 5: To provide a framework within which to develop a multi-choice, high capacity transport system that is financially and economically viable, environmentally acceptable, energy efficient and makes provision for the safe and convenient movement of people and goods.

Objective 6: To formulate a strategy that can be carried out both by the public and private sectors under variable circumstances, particularly with respect to the availability of resources and significant changes of demand.



**Figure 3** Squatter area located in the metro area – the Dae Hom Village at Diamond Hill.



**Figure 4** New sky-scrapers and aged buildings co-existed in the urban centre of Wanchai in the Island of Hong Kong.



**Figure 5** Illegal structure constructed on the roof top of some post-war buildings in Yaumati District of Kowloon.

After years of studies, some of which were done by independently appointed consultants, and the carrying out of thorough public consultations and debates, the TDS has arrived at a generally accepted direction, which comprises with various scenarios and goals that may cater different development situations and rates of growth.

The main scope and major studies in the TDS covers the general development principles, scenarios on economical and population growth, overall review studies, land use and development patterns, formation of new land and new townships, urban restructure and renewal, distribution of socio-economical centres, rural and environmental preservation, port and airport development strategies, as well as land transportation systems etc. Targeted guidelines have been set for each studied areas according to short, medium and long-term needs and each strategic area is going to be fine-tuned according to the condition and pace of development in Hong Kong as a whole under appropriate legislative and executive procedures.

## 5 STRATEGIC DEVELOPMENT SUB-REGIONS

To have the development strategies implemented in a more efficient manner, the territory of Hong Kong is divided into five sub-regions according to their geographical positions, sectoral functions or development history and patterns etc. These regions are further detailed as below.



**Figure 6** Sub-Regions according to the Strategic Development of Hong Kong.



### **5.1 Metro Area**

Existing condition – It includes the Island of Hong Kong; east, central and west Kowloon; and the Kwai Tsing and Tsuen Wan districts. Present population is about 3.24 million. Except for the southern part of Hong Kong Island where natural coastline is basically preserved, it is a relatively high-density development zone with mixed urban land uses.

Growth direction – The prime objective in the development strategy is to thin-out some of the high-density zones and to restructure some of the old districts such that social and commercial facilities can be better and more conveniently allocated. New highway and mass transit system will continually be provided to ease off the transportation needs between major sub-districts. The development to be a focus point as principal tourist centre and cores for main government and cultural functions will be continued.

### **5.2 North-West New Territories**

Existing condition – It houses a population of about 1.1 million and majority of which are situated along the Tuen Mun-Yuen Long Corridor and the Yuen Long-Kam Tin Plain. Present developments are quite unstructured except around new towns which have been developed since the mid 70's.

Growth direction – Except to support the new towns with significant amount of population, the region is also intended to develop as a “flow corridor” linking the border with Mainland China; new centres for mass housing will be provided at Tin Shui Wai, Yuen Long South and areas around main transport nodes. In order to improve the existing environment, upgrading of the semi-urbanized areas along Tuen Mun/Yuen Long Corridor is a prime issue in the overall development strategy of the region. At the same time, village and private residential developments are confined strictly within the scope of current statutory plans. At the west of Tuen Mun, it will be intensified to use as river trade and port development as well as to provide land for other special industrial uses. The protection of the Mai Po Marshes which are of unique ecological significance will also be intensified.

### **5.3 North-East New Territories**

Existing condition – Existing population is about 1.02 million. Majority of the population is gathered within a south–north running strip of land in which the East Rail of Kowloon-Canton Railway form the core of development. Major population centres include Shatin, Tai Po, Fanling, Sheung Shui and Ma On Shan, all can be regarded as new towns developed gradually from the original village-base rural township since the mid 70's. The region also covers large areas of natural preserved land with mountain ranges, catchment areas and sea coasts.

Growth Direction – Continual development will be consolidated within the context of existing outline zoning plans. Strategic growth will be cored around the railway corridor to receive for another increase of at least 0.15 population within the coming decade. Emphasis will continually be made on conservation of the environment, and provision of low-density housing, tourist and recreation facilities in selected locations.

#### **5.4 South-West New Territories**

Existing condition – This part of the territory mainly comprises of the inhabited outlying islands of Hong Kong. These islands include the Lantau, Peng Chau, Cheung Chau and Lamma islands. Within an area of about 140 sq km, it has a population of about 0.11 million. Except for the Fixed Lantau Crossing, the Lantau Express and the North Lantau Expressway opened in 1998 leading to the new airport in Chek Lap Kok at Lantau, there is no other land-based transport leading to these outlying islands.

Growth Direction – Major growth will be clustered in the new towns along the north coast of Lantau Island. The new town of Tung Chung was developed in 1996 and intended to be a working base during the construction of the new airport as well as to house another 0.15 million people in the coming decade. With the signing of an agreement with Walt Disney in 1999 to develop a new theme park in the north-east corner of Lantau at Penny's Bay, there is a strong tendency to develop Lantau into a resort and recreational centre subject to detail investigation by the government. While the central and southern portion of Lantau will be retained as a semi-preserved zone such that the green areas, natural beaches and some old monasteries that were built at least half a century ago can be protected.

#### **5.5 South-East New Territories**

Existing condition – The territory is one of the best preserved areas in Hong Kong. The Sai Kung Country Park, the High Island Reservoir and countless uninhabited islands and coastal beaches are lying within this region of the territory. There is about 0.36 million of the population living in this 80 sq km of land. Within which about one-third are living in the scattered low-density houses around the old village town of Sai Kung, and the rest are living in the new town of Tseng Kwan O.

Growth Direction – Major growth will only be confined in the new town of Tseng Kwan O. With the opening of the Mass Transit Railway Tseng Kwan O Extension Line in 2003 and the full development of the vicinity by the end of the decade, population is expected to escalate to about half a million. The rest of the areas will be retained as a preserved zone with limited low-density development under stringent control.

### **6 REVIEW OF EXISTING INFRASTRUCTURE DEVELOPMENT**

It could be assumed that there was practically no planned infrastructure provision for Hong Kong on a territorial scale before the 60's. Every future planning was then on a rather short-term basis depending on almost ad-hoc development opportunities. As the population grew dramatically in the early 60's and the gradual maturity of the manufacturing industries of Hong Kong, the needs to provide more land for the industry and to accommodate the growing population were becoming obvious. The first two satellite towns of Tsuen Wan and Kwun Tong on the western and eastern ends of the Kowloon Peninsula were then developed to relieve such needs.

As population centres grew in a somewhat arbitrary manner in the 70's, bottlenecks of various natures appeared. Common problems such as traffic jams, over development, environmental degradations, under provision of the required urban facilities etc., caused great nuisances to the efficient operation of the city.

Large-scale coordinated infrastructure projects aimed to improve the traffic and other supporting systems within the territory started in the late 70's. These projects can be summarized into 2 main categories according to their geographical sub-region.

## 6.1 Major Link from Metro into the New Territories (NT) and the Lantau Island

<u>Year Between</u>	<u>Major Projects</u>
1910	<ul style="list-style-type: none"> <li>• Introduction of the 33.7 km single-tracked Kowloon-Canton Railway serving from Tsim Sha Tsui (South Kowloon) to Lo Wu (North NT).</li> <li>• Other linkage into the NT mainly through pedestrian footpaths and an unpaved single lane roadway on the western side of NT.</li> </ul>
1910–1940	<ul style="list-style-type: none"> <li>• Situation remains unchanged but with an additional roadway from central Kowloon to Central NT.</li> </ul>
1950–1960	<ul style="list-style-type: none"> <li>• Roadway paved and extended to single lane for both ways.</li> <li>• Introduction of a simple circular road network in NT with a single-lane both directions roadway crossing the 960m Tai Mo Hill in Central NT.</li> <li>• Development of the first new town (Tsuen Wan) in the south-western part of NT.</li> </ul>
1960–1970	<ul style="list-style-type: none"> <li>• Opening of the Lion Rock Tunnel linking central Kowloon more directly to the Central NT (1967).</li> <li>• Introduction of the first 2-lane 2-way highway linking western Kowloon to south-western part of NT (Kwai Chung Road).</li> </ul>
1970–1980	<ul style="list-style-type: none"> <li>• Opening of the 2-lane 2-way Tuen Mun Highway that provided swifter traffic for the western part of NT.</li> <li>• Development of two more new towns (Tuen Mun and Shatin) in the western and central-southern part of NT.</li> <li>• Opening of the second Lion Rock Tunnel (1978).</li> </ul>
1980–1990	<ul style="list-style-type: none"> <li>• Completely double-tracked and electrified of the Kowloon-Canton Railway system (1983).</li> <li>• Opening of the 3-lane 2-way Tolo Harbour Highway serving the Central NT from south to north (1985).</li> <li>• Opening of the Light Rail Transit with a route length of 32 km serving the north-western part of NT along the Tuen Mun-Yuen Long Corridor (1988).</li> <li>• Large scale traffic improvement and road extension to the north-western and central part of NT.</li> </ul>
1990–1995	<ul style="list-style-type: none"> <li>• Opening of the 2.8 km Shing Mun Tunnel linking Tsuen Wan to Shatin in the south-central part of NT (1990).</li> <li>• Development of the Tseng Kwan O New Town (with a linking tunnel) at the eastern-end of New Kowloon.</li> </ul>

	<ul style="list-style-type: none"> <li>• Opening of the Tate's Cairn Tunnel linking eastern Kowloon with Central NT (1991).</li> <li>• Development of Ma On Shan New Town on the central-eastern part of NT.</li> <li>• Development of Tin Shui Wai New Town on the north-western part of NT.</li> <li>• Development of the north-western NT (Tuen Mun, Yuen Long and Kam Tin) and the central-northern NT (Tai Po, Fanling and Sheung Shui) corridors.</li> <li>• Completion of the NT Circular Road (in 4 main stages) that provides high speed traffic link for the central, northern and western part of NT.</li> <li>• Large scale traffic improvement and road extension to enhance existing highway network throughout the NT.</li> </ul>
1995–2000	<ul style="list-style-type: none"> <li>• Development of Tung Chung New Town at Lantau Island.</li> <li>• Opening of the new international airport at Chek Lap Kok.</li> <li>• Opening of the Lantau Links comprising a series of long-span channel crossing bridges.</li> <li>• Opening of the Tung Chung Line and the Airport Express Line which underlie the future large-scale development of Lantau Island.</li> <li>• Opening of the Route 3 comprising of a long-span cable-stayed bridge (Ting Kau Bridge) and a 5.4 km long country park crossing tunnel (Tai Lam Tunnel).</li> </ul>
2000–2005	<ul style="list-style-type: none"> <li>• Opening of the West Rail that provides a swifter traffic link for the north-western part of NT.</li> <li>• Opening of the Mass Transit Railway Tseng Kwan O extension to provide a direct link to the new town of Tseng Kwan O with the metro.</li> <li>• Opening of the Kowloon-Canton Railway Ma On Shan Line to provide the necessary linkage of the new town to the East Rail of the railway network.</li> </ul>

## 6.2 Major Infrastructure Development within Metro Areas of Hong Kong

<u>Years between</u>	<u>Major Projects</u>
1960–1965	<ul style="list-style-type: none"> <li>• The first highway linking between Wanchai and Central in Hong Kong Island (about 1.8 km in length).</li> </ul>
1965–1970	<ul style="list-style-type: none"> <li>• The first highway linking central to eastern part of Kowloon (about 6 km from Kowloon City to Kwun Tong).</li> </ul>
1970–1975	<ul style="list-style-type: none"> <li>• The first highway linking the eastern to western part of Kowloon peninsula along the foot of Kowloon peaks (8.5 km in length from Lai Chi Kik to Diamond Hill on northern part of Kowloon).</li> <li>• The first cross-harbour tunnel joining Hong Kong Island and Kowloon (1972).</li> <li>• Opening of the first Tsing Yi Bridge triggering the large-scale development of the Tsing Yi Island (1974).</li> </ul>

1975–1980	• Opening of the first phase of Mass Transit Railway (1979).
1980–1985	<ul style="list-style-type: none"> <li>• Opening of the first Ap Lei Chau Bridge linking the 2 sq km island to Aberdeen at the southern part of Hong Kong Island.</li> <li>• Opening of the second phase of Mass Transit Railway (1982).</li> <li>• Opening of the Aberdeen Tunnel linking the northern and southern part of Hong Kong Island (1982).</li> <li>• Opening of a 1.8 km tunnel under the Kai Tak Airport to provide a direct link between the central and eastern part of Kowloon (1982).</li> <li>• Opening of the first phase of island eastern corridor (part of the Hong Kong Island northern bypass).</li> </ul>
1985–1990	<ul style="list-style-type: none"> <li>• Opening of the West Kowloon Corridor (a 4.5 km expressway/inter-change system on the western side of Kowloon up to Kwai Chung).</li> <li>• Completion of the final phase of the island northern bypass (totally 13 km expressway/interchanges system from Chai Wan on the east to Kennedy Town on the west, 1989).</li> <li>• Opening of the second cross-harbour tunnel (Eastern Harbour Crossing, 1989).</li> <li>• Final completion of the Mass Transit Railway with the second cross-harbour linkage through the Eastern Harbour Crossing (1989).</li> </ul>
1990–1995	<ul style="list-style-type: none"> <li>• Large-scale road improvement throughout the metro areas.</li> <li>• Opening of the Tseng Kwan O Tunnel to accelerate the development and moving into the Tseng Kwan O new town.</li> <li>• Opening of the Kwun Tung Bypass (a 2.6 km elevated expressway/inter-change system to link up the Tate's Cairn Tunnel and to ease the traffic of the eastern part of Kowloon).</li> </ul>
1995–2000	<ul style="list-style-type: none"> <li>• Large-scale road improvement throughout the metro areas.</li> <li>• Opening of the third cross-harbour tunnel (Western Harbour Crossing, 1997).</li> <li>• Opening of the West Kowloon Expressway (part of a 34 km expressway connecting the cross-harbour tunnel to the new airport in Lantau Island, 1997).</li> <li>• Opening of the Hung Hom Bypass (a 1.2 km expressway/interchange to ease the traffic of the southern part of Kowloon, 1999).</li> </ul>

## 7 OVERALL INFRASTRUCTURE PROVISION

Stepping into the mid 80's, infrastructure developments in Hong Kong were introduced at a much organized, long term and coordinated manner. Reasons for this positive shift can be explained by a number of factors. Besides the actual needs of the community as well as the rapid growth in economy due to the success of Hong Kong in securing her position as a regional business and finance centre in South East Asia that provided the capital for development, one guaranteed step was that a joint declaration to return Hong Kong to Mainland

China was made in 1984 between the British and Chinese governments that clarify the future of Hong Kong. With that agreement, more definite investments and resources planning could then be arranged.

Infrastructure developments in Hong Kong in general are aimed at several directions and levels, with rail and highway networks, population centres and new towns, airport and ports, urban restructuring, and environment as the major strategic cores. These cores are integrated and interrelated to form an overall strategic development that aims to restructure, improve and achieve the objectives as stated in previous pages. Detail implementation is somewhat based on the territorial sub-regions for the effectiveness in planning and achieving the set targets. This paper tries to pay more concentration on the parts related to rail and highway networks for it is the backbone of all developments as well as it calls for a huge amount of resources and capitals.

### 7.1 The New Airport at Chek Lap Kok in the Lantau Island

The old Kai Tak Airport was located in the centre of Kowloon since the 20's. Her existence was quite awkward when compared to other achievements in terms of population and economic growth of Hong Kong. Kai Tai Airport was both dangerous as it is located in the heart of a high-density city and at the same time could not satisfy the demands from all needs.

**Figure 7** The new International Airport of Hong Kong and the new town of Tung Chung (foreground).



**Figure 8** Layout of the airport seeing the Passenger Terminal Building and the first runway (the second runway on the north along the seawall, was under construction).

After numerous studies and debates, Chek Lap Kok at the north-eastern side of Lantau Island was selected as the site for the new airport. Besides providing a new airport 3 times larger than Kai Tak, it also serves the following functions:

- To relocate the source of air traffic noise to areas with lower population density.
- To relieve huge amount of buildable space in the metro areas by releasing the air traffic height restriction.
- Strengthen the air cargo handling capacity of Hong Kong.
- Provide the land reserve to develop a new commercial, conference and exhibition centre at the threshold of the airport.
- Provide a transportation link from the metro area to Lantau, the largest outlying island of Hong Kong. This is an initial investment for the development of Lantau.
- Trigger the development of the first new town (Tung Chung) in Lantau.
- Provide part of the highway traffic improvement strategic backbone for the north-western part of New Territories.

To have the new airport made deliverable in mid 1998, the following related infrastructure works have been carried out starting from 1994.

- Formation of the new airport platform by the levelling of the original Chek Lap Kok Island (430 Hectares) and to reclaim the nearby sea to form a 1250 hectares airport island site (contract cost US\$1.16 billion)
- Construct the Passenger Terminal Building (contract cost US\$1.95 billion).
- Construct two 3.8 km long runways and the associated taxiways (contract cost US\$0.95 billion).
- Construct other ancillary and transportation facilities within the airport island (contract cost US\$0.58 billion).

## **7.2 The Airport Core Projects**

The new airport at Chek Lap Kok is located more than 30 km from the city centre on an originally uninhabited island. The provision of the new airport in fact serves several purposes and sets an important developmental pattern in the overall restructuring of the Hong Kong territory. To implement the plan, 10 related projects, known as the 10 Airport Core Projects (ACPs), were carried out at the same time together with the construction of the new airport. The 10 ACPs can be summarized as follows:

- The new airport at Chek Lap Kok – to form the airport island and provide the required facilities including the terminal building, runway, taxiway, ground transportation and other ancillary facilities to enable the construction and operation of the new airport to replace the old one at Kai Tak.

- Development of the Tung Chung new town – to form and develop a new town from the old village town of Tung Chung (2.5 km on south-eastern side of the terminal building), which is to be used as a support base during the construction of the new airport, and become a population centre to house a population of about 200,000 by the end of 2015.



**Figure 9** Layout of the Tung Chung New Town as seen in mid 1997.

- North Lantau Expressway – a 12.5 km long 3-lane both directions expressway constructed along the north coast of Lantau Island to provide direct linkage from the new airport to the metro areas. Several interchanges are provided to allow for the future development of population centres at appropriate locations.



**Figure 10** The formation of the North Lantau Expressway at Yam O Section as seen in mid 1996.



**Figure 11** The completed section of Expressway as seen in late 1997.



- Lantau Link – this is a series of bridges and elevated expressway linking two sea channels with a total distance of about 2.9 km. It comprises the Tsing Ma Bridge (suspension bridge with main span 1377m, Ma Wan elevated expressway (viaduct, about 600m long) and the Kap Shui Mun Bridge (cable-stayed bridge, main span 430m).



**Figure 12** The Lantau Link, with the Kap Shui Mun Bridge in the foreground and the Tsing Ma Bridge in the background.

- Route 3, Kwai Tsing Section – a 7.5 km, 4-lane both ways expressway, provide direct linkage from Lantau Link to western Kowloon. It serves also as an interchange to the Route 3 Country Park Section, another 14 km expressway leading to the north-western part of the New Territories and the border areas.



**Figure 13** Route 3 Kwai Chung Section along the very busy Kwai Chung highway.

- West Kowloon Reclamation – to reclaim along the original seawall of western Kowloon to form a strip of new land about 340 hectares in size to accommodate a new expressway, the airport railway, two railway stations and other supportive land for necessary future development. This land forms an important part for the strategic renewal and restructuring of the high-density districts at western Kowloon.



**Figure 14** West Kowloon Reclamation on the southern tip of Kowloon.

**Figure 15** West Kowloon Expressway on the West Kowloon Reclamation site at Mei Foo District.



- West Kowloon Expressway – a 4.5 km expressway linkage between Hong Kong Island (through the third harbour crossing tunnel) in the south to Route 3 in the north. Three major interchanges are provided to allow traffic to enter/exit into the expressway from West Kowloon.
- Western Harbour Crossing – this is the third harbour crossing tunnel joining the western part of Hong Kong Island with west Kowloon. Interchange provision at the Hong Kong side is also serving an important role for the continual development of the western and southern part of Hong Kong Island.



**Figure 16** Coupling arrangement and approach ramp for the Western Harbour Crossing on the south-most tip of the West Kowloon Reclamation.



**Figures 17 and 18**  
Central Reclamation as seen in mid 1995 (above) and early 1998 respectively. The 20-hectare reclaimed area is used as the Terminal for the Airport Railway, ferries for the outlying islands, as well as reserved land for the Central-Wanchai Bypass and other private developments.

- Central and Wanchai Reclamation – to form a piece of land of about 20 hectares in size at the geographical, financial and political centre of Hong Kong. It accommodates the new passenger terminal of the Airport Railway, and to provide extra land for the Central-Wanchai Bypass and other commercial developments.
- The Airport Railway (Airport Express Line and the Tung Chung Line) – a 34 km-long railway line serving the new airport and the new town of Tung Chung to the metro. There are 7 stations/terminal along the line at this stage, most of these stations are designed as transport nodes to support developments of community, residential or commercial nature.

### **7.3 Future Strategies in Transport Systems and the Related Infrastructure Development**

According to the TDS review, principal areas of concern from a strategic planning point of view with regard to transport systems in Hong Kong can be summarized as follows:

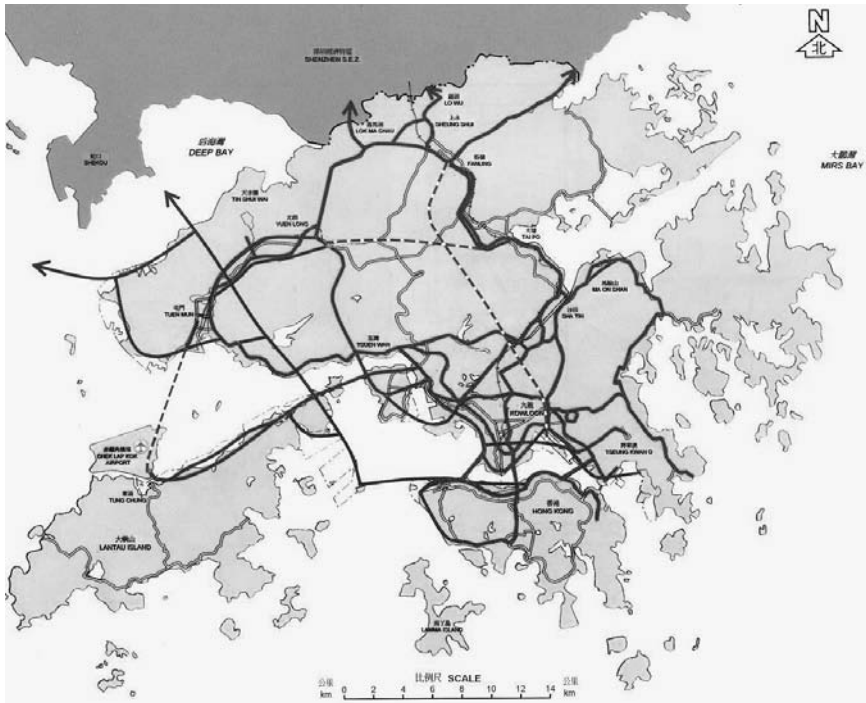
- To improve the distribution of population and jobs in a way that helps to minimise the need for travel and, at the same time, concentrates development in a well designed way within the walking distance from major public transport nodes.
- To provide a comfortable, efficient, safe, affordable, multi-modal and environmentally acceptable public transport system that gives good levels of accessibility to residential areas and work places.
- To provide a hierarchy of highways and freight railway services, including the provision of adequate cross border links, to facilitate the movement of goods between centres of demand and supply as to sustain key economic activities.
- To provide comprehensively designed pedestrian networks that facilitate the safe and convenient movement of people within the catchments of transport nodes and interchanges.
- To stress the need for greater provision for high-capacity passenger mover systems within the metro areas as well as between the metro and new population/job centres. Parallel efforts to be made for the upgrading and expansion of public bus services to meet both intra and inter-zonal travel needs in areas beyond the walking distance of railway stations.

### 7.3.1 Highway Strategies

With regard to the strategic highway network, a number of new links and extensions that aim to create a denser web of North–South and East–West high-capacity expressways within the territory will be developed in appropriate stages.

In the metro areas where room for expansion is indeed highly limited, major highway projects are confined to segmental, short-sectioned roadwork acting mainly as an extension to existing highway networks rather than major development in a large-scale strategic manner. The following are the major projects in the strategic planning within the metro areas:

- The Central–Wanchi Bypass and a section of link roads into the existing Island Eastern Corridor – with the provision of this bypass, a continual expressway with at least 3-lane both ways can be provided along the northern coast of Hong Kong Island. However, the execution of the project is subject to the approval of the reclamation in the Wanchai area.
- The Route 7 – a 2-lane both ways highway linking the Belcher Bay on the western end to Aberdeen on the southern part of Hong Kong Island. This is important for the strategic development of the south-western part of the island, which is at present only relatively moderately-populated and has potential to develop further.
- The Central Kowloon Route – to provide an east–west running 3-lane both ways highway link, mainly in the form of subway, that cuts across the densely-developed areas in the central part of Kowloon Peninsula.
- The Route 9 – a 7 km long expressway with tunnel and a 1100m span bridge linking Tsing Yi Island to Stonecutters Island and reach Lai Chi Kok. This is an improvement project to enhance the entire traffic flow in the western part of Kowloon.



**Figure 19** Strategy Highway Network under the 1996 Territorial Development Strategy Review.

For non-metro areas, majority of the highway development are concentrated on the north-western part of the New Territories which is the only sub-region within the territory with major strategic growth in population and other communal-economical activities. The following major projects are prioritized and would be carried out in the medium-term highway strategic plan.

- The Route 10 – a 3-lane both ways expressway serves as the Hong Kong Western Corridor to provide direct link from the western part of Hong Kong Island through a series of bridges and tunnels, via Lantau Island, Yuen Long, and finally reach the western border between Hong Kong and the Mainland. This would provide an additional strategic link between the north-western part of New Territories and North Lantau, relieve pressure on Route 3 Country Park Section and cater for cross-border traffic in the future.
- A 3-lane both ways highway link connecting the Western Corridor of Shenzhen at the Mainland side of the border.
- A 3-lane both ways coastal highway running along the west coast of Tuen Mun, join the new town of Tin Shui Wai, and reach the Yuen Long plain at the end. This is important for the development of the area into a river trade centre as well as with land reserve for special industries. The highway network will also cater for necessary

interchanges for possible traffic linkage to the Zhuhai Special Economic Zone of Mainland China on the west bank of the Pearl River.

- Widening of the Yuen Long Highway and to provide major interchanges to the existing and newly introduced highway network within the areas.
- Widening of the Tolo Highway and Fanling Highway, which is the only highway system serving the central-eastern part of the New Territories.
- Provide a new 3-lane both ways coastal highway from the eastern tip of Kowloon into the new town of Tseng Kwan O.

### 7.3.2 *Railway Strategies*

The Kowloon-Canton Railway Corporation (KCRC) and the Mass Transit Railway Corporation (MTRC) are two government-based corporations at present operating the railway network system of Hong Kong. The present railway networks running under the two corporations are:

- KCRC – At present only the KCR 35 km-long East Rail is serving the central part of Kowloon and New Territories from Hung Hom in the south to Lo Wu in the north, passing through 10 intermediate stations.

However, by the end of 2004, two more railway lines will be put into operation. They are the 31 km-long West Rail (US\$8.2 billion) serving the north-western part of New Territories from Sham Shui Po in the south to Tuen Mun in the north (with 8 intermediate stations), as well as the 11.5 km-long Ma On Shan Line serving the new town of Ma On Shan on the east bank of the Tolo Harbour (with 7 intermediate stations).

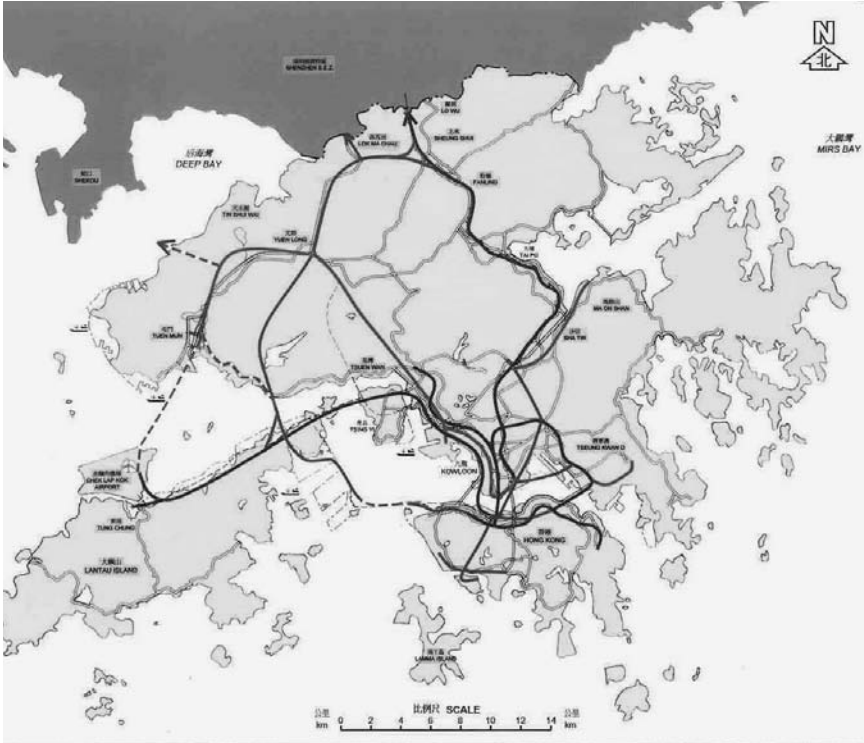
- MTRC – At present there are 5 underground railway lines operated by the corporation serving mainly within the metro areas. They are the Island Line running along the northern coast areas of Hong Kong Island; the Quarry Bay Line running from the eastern part of Hong Kong Island through a submerged tube across the harbour to the central-eastern part of Kowloon. The Tsuen Wan Line running from Central of Hong Kong Island, then across the harbour and serves the western portion of Kowloon until it reaches Tsuen Wan. The Tung Chung Line runs from Central to the new town of Tung Chung at Lantau Island. The last one is the Airport Express Line providing direct link from Central to the new airport at Chek Lap Kok. The 5 lines altogether have a length of about 77 km and serve about 35% of the total population in the territory.

Before the end of 2003, the 12 km-long Tseng Kwan O Line with 5 intermediate stations shall come into operation and serve the new town of Tseng Kwan O.

In order to cater for the continual population growth of Hong Kong up to 2015 and the expected increasing cross border social and economic activities, the expansion of the railway network is ranked as the priority in the government's

strategic planning in recent years. The forthcoming railway network will be so designed to fulfil the following objectives:

- To relieve the bottlenecks in the existing railway systems.
- To provide rail service to strategic growth areas for housing and economic developments.
- To meet cross border passenger and freight demands.
- To increase the share of rail in the overall transport system to reduce reliance on road-based transport.



**Figure 20** Strategy Railway Network under the 1996 Territorial Development Strategy Review.

To achieve the intended objectives, a number of specific railway schemes are short-listed for the formation of the basic network options. These include:

- The North Hong Kong Island Line – the existing Island Line of MTR will be extended and re-aligned to form a continual line of about 24 km along the north shore of the Island of Hong Kong. The sections to be extended will be the North Point-Central link (4 km) in the island centre and the Sheung Wan-Kennedy Town extension (3.8 km) serving the western part of Hong Kong Island.

- East Kowloon Line – this will be a new line connecting the MTR Diamond Hill Station to the KCR Hung Hom Station. It will serve the eastern part of the Kowloon Peninsula in which no railway service exists at the present moment. In a longer term, the line may be further extended to Hong Kong Island by the fourth harbour-crossing tunnel in the south and to the North-eastern New Territories through a new tunnel to Tai Wai station of the KCR East Rail in the north.
- Kowloon Southern Link – this is an extension of the West Rail to link with East Rail of KCRC through the southern tip of the Peninsula at Tsim Sha Tsui. This 4 km-long railway linkage is considered to be very critical in the overall network system, for it can physically connect two very important railway lines to provide convenient interchange for passengers between the East Rail to the West Rail.
- The Northern Link – similar to the Southern Link, the 12 km-long Northern Link will connect the East Rail to the West Rail on the north-western portion of the New Territories, such that the railway network will be able to have a completed circuit serving the majority of the strategic development sub-regions.
- The Regional Express Line – the purpose of this line is to provide an express rail service that links the urban area with the borders between Hong Kong and Mainland China, in addition with limited stops providing fast domestic service to the northern portion of the New Territories. This 35 km-long express line will be running mainly through tunnels crossing the hilly central part of the New Territories. The urgency to construct this express line is supported by the average 18% annual growth of cross-border passengers in recent years, which will soon over-saturate the already very busy cross-border check point at Lo Wu.

The strategic railway network as proposed above costs about US\$12 billion, its implementation will of course depend on the actual economical and population growth, as well as engineering and environmental studies, that will be carried out from time to time in conjunction with the implementation and coordination of other railway projects.

#### **7.4 New Towns**

To cope with the increase in population and to improve the living environment by decentralizing the population from the over-crowded metro areas, Hong Kong has developed nine new towns since the initiation of her New Town Development Programme in the early 70's. The new towns by now accommodating a population of about 2.7 million and the programme is aimed to provide housing for at least 3.8 million people by the end of 2010.

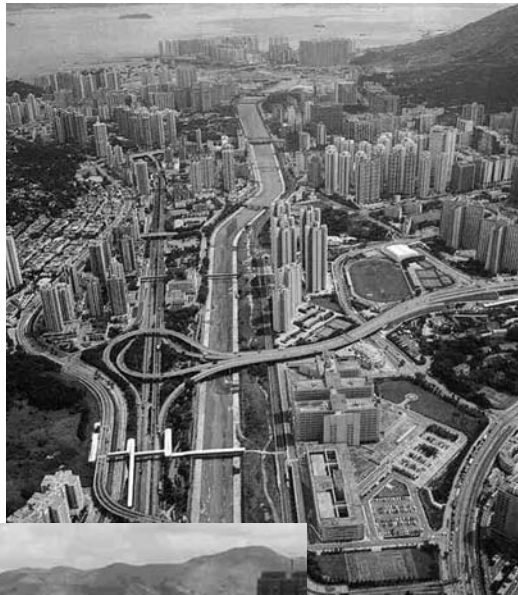
The new towns development can be grouped roughly under three generations. Tsune Wan, Shatin and Tuen Mun developed in the early 60's up to mid 70's being the first generation of new towns; Tai Po, Fanling/Sheung Shui and Yuen Long in the late 70's being the second generation; and Ma On Shan, Tseng Kwan O and Tin Shui Wai in the mid 80's onward being the third generation of new towns. The basic concept in developing these new towns is to



provide a balanced and self-contained community as far as possible in terms of provision of infrastructure, community facilities and other basic needs.

The development process for new towns, rural townships and new major developments in the metro areas has exhibited a lot of teething problems and detail planning is thus called for in a carefully coordinated manner. In general, for rural townships, the major concerns are for township improvement, provision of the needed infrastructure and community facilities, as well as sometimes flood protection. For new developments in the metro areas, new land will be formed to allow growth and to decant existing population, and to provide or upgrade facilities to enable the redevelopment of old and run-down areas. The functional, environmental and aesthetic aspects of the developments are given priority in consideration in the development process.

**Figure 21** The Tuen Mun-Yuen Long Corridor on the North-Western New Territories.



**Figure 22** The New Town of Tseng Kwan O as seen in early 2000.



**Figure 23** The old urban centre of Kwun Tong and her neighbourhood.

**Figure 24** View of the external façade of some old buildings in Kwun Tong constructed in the mid-60's.



Though the development of new towns may have significant differences in their development history, specific geographical environment and constraints, or a particular set of policies and criteria standards applied to their design according to the value and mind-set of the town planners and decision makers by the time the new towns were to be developed, it is beyond doubt that Hong Kong has obtained valuable experience in the development processes of these new towns.

Dating back to the early 60's when Tsuen Wan was being developed, where the town was just provided with the very basic urban facilities that could enable the subsistence of low-income settlers as factory workers. Then came the new town of Shatin in the mid-70's, where the concept of large areas of community spaces and bicycle paths were introduced linking between most public estates and communal centres. Finally to the new town of Tin Shui Wai or Tseng Kwan O in the early 90's, where a mass transit system is employed and the emphasis on a green and energy efficient township design becomes an appealing slogan. It is hard to comment whether there are drastic improvements exhibited in these generations of new town development due to incomparable background. It is still fair enough to conclude that planners and decision makers by now can at least avoid errors that we have frequently made in the past and gained the advantage of having a better chance to provide new township, which is more efficient and operational, and with higher quality in terms of environment and living standards.

## 8 CONCLUSION

Hong Kong can hardly be regarded as a self-sufficed system in developing herself into a modern and efficient city within the present reality of topography, territorial and population size. Hong Kong can only afford to work according to stringent constraints and limits. Within a short development history of 4 to 5 decades after the Second World War, and based on quite a lot of odd backgrounds, from unstructured ad-hoc schemes to the adaptation of a well-structured strategic planning process in development, it is a big step forward.

The process of development for sure is not a smooth exercise for Hong Kong. Experience, knowledge and technological know-how is only the least of the problems. Physical or economical limitations are the second level of concern. In fact, the key issue may come from the political environment which includes whether there is an effective decision making mechanism based on recognized legislative procedures acceptable by the general public, or whether it can balance the interests of major parties such as from investors, political parties, pressure groups or other voices from ordinary people represented by the media. In the past years, decisions were made in a closed-door manner where public consultation did not exist in practice. People had no way to input their ideas or raised comments to major policies or actions taken by the government.



**Figure 25** Views of the border between Hong Kong and the Mainland near Lok Ma Chau.

**Figure 26** Border at Lo Wu. The background in the photo is the Shenzhen Special Economic Region of Mainland China. Note the wetland on Hong Kong side which is by now mainly zoned as restricted areas due to internal security reasons.



However, the way to make important decisions has changed, the government nowadays has to carry out a lot of studies, produce piles of technical reports and proposals, conduct public consultation on various levels, prepare work schemes and implementation plans, or to lobby numerous concerning parties to obtain understanding and acceptance in an informal manner in order to pass through all the required legislation or executive procedures, most of which are controlled under independent councils or committees. Except that it takes a much longer time to have a plan implemented, the controlling exercise and function does ensure a high-quality, rationalized and balancing decision be made.

After the return of the sovereignty of Hong Kong back to Mainland China, interaction between the two places has been intensified, not necessarily on the political but on social and economical levels, that makes predictions for making future decisions become more difficult. For instance, should Hong Kong be acting more independently as she was without making necessary coordination with the Chinese government in territorial planning in case issues where regarding cross border matters are concerned? This is extremely important where transportation, environmental, or in the joint development of border areas are taken into consideration so that the two places may have a chance to merge sensibly together to form and function as a megacity as a whole. Hong Kong and her neighbouring city Shenzhen, which is only a few hundred metres north of the border, will have a total population of more than 12 million in the decade to come. We cannot afford to ignore this urging reality. The existing way Hong Kong is using the northern part of her territory with about 90 sq km of land being restricted areas and fenced-off from development is highly questionable. Hong Kong is not being tightly restrained, there is still plenty of room for innovative ideas to help shape the future of Hong Kong in a much more creative way.

Anyway, Hong Kong is somewhat on the right track heading for a more reasonable direction under relatively reliable vehicles. What we need to do is to make the necessary fine-tuning at the required moment, provided that the political environment within Hong Kong can maintain stability and rationality.

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