10 major infrastructure projects for Hong Kong's economic growth undertaken in the 2007-2008 Policy Address announced by Chief Executive of HKSAR in early October 2007

The Highlights

Presentation by Raymond Wong
City University of Hong Kong
December 2011

2007-08 Policy Address

A New Direction for Hong Kong

- Promoting community development through revitalisation
- Promoting social harmony by helping people to help themselves

Some background about Hong Kong's infrastructure development since 1950s

1950 -1965 Recovery about WW2

1st generation of public houses (resettlement estates), basic road network enhancement, development of satellite towns (Tsuen Wan, Kwun Tong, Chaiwan)

1970 -1980 Uplifting ground work to meet modern needs

target at international finance centre, container port, 1st generation of highway and railway (MTR) network, large scale public housing

1990 - 2005 Kicking off large scale strategic developments

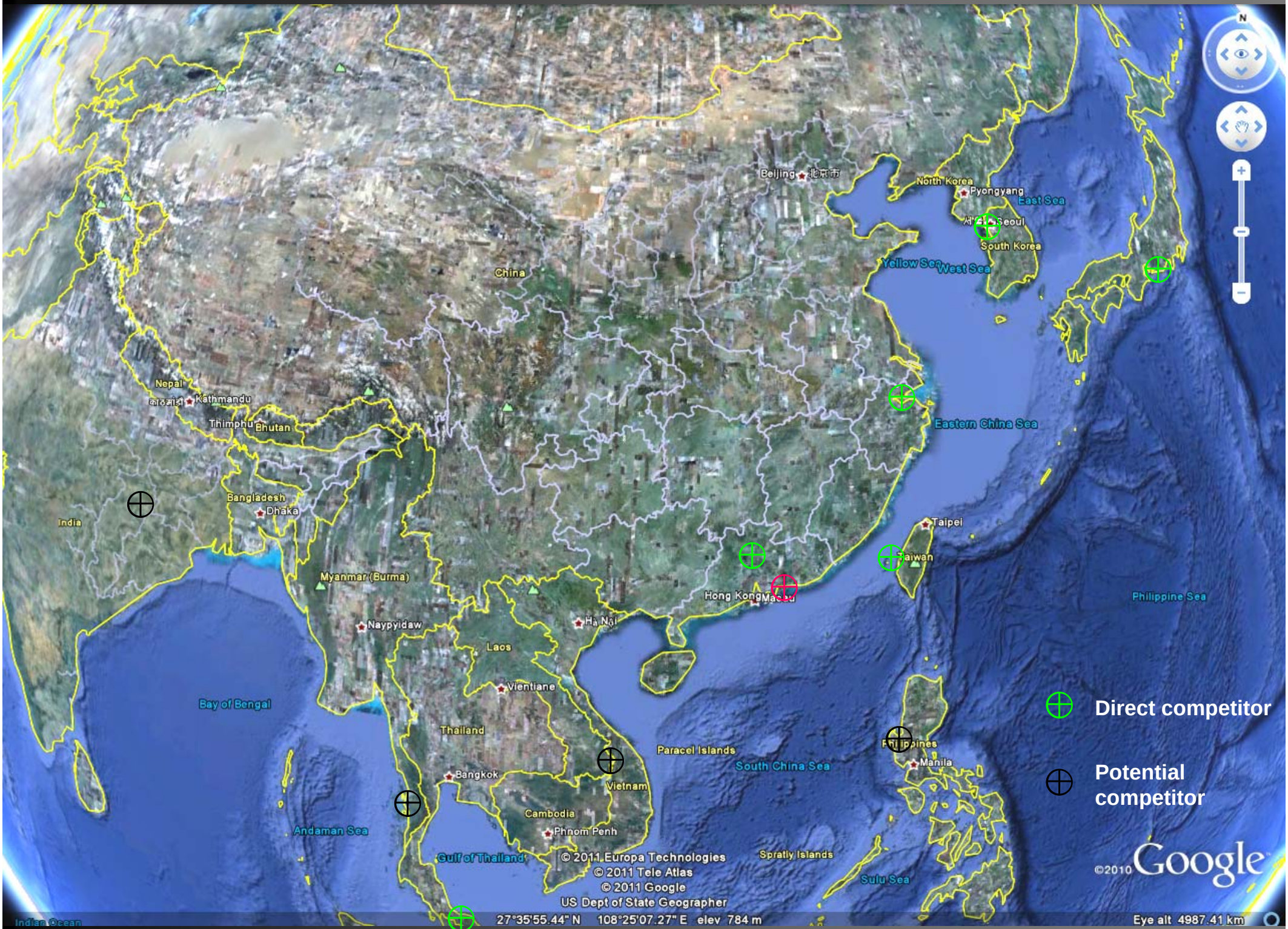
new airport and the associated projects, implementation of strategic railway and highway development scheme, other strategic project including Cyberport, Disney Theme Park, port development, land formation projects etc.

Formation of the Shatin New Town in the late 1970s

Formation of the Shatin New Town in the late 1970s

Shatin in 2000

Formation of Tuen Mun New Town in the early 1980s


Direct competitor
Potential competitor
Beijing
North Korea
Pyongyang
East Sea
Seoul
South Korea
Yellow Sea
West Sea
China
Eastern China Sea
Nepal
Kathmandu
Thimphu
Bhutan
Bangladesh
Dhaka
India
Taipei
Taiwan
Hong Kong
Philippine Sea
Myanmar (Burma)
Naypyidaw
Ha Noi
Laos
Vientiane
Bay of Bengal
Thailand
Paracel Islands
South China Sea
Philippines
Manila
Bangkok
Vietnam
Cambodia
Phnom Penh
Andaman Sea
Gulf of Thailand
Spratly Islands
Sulu Sea
Indian Ocean
© 2011 Europa Technologies
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US Dept of State Geographer
27°35'55.44" N 108°25'07.27" E elev 784 m
©2010 Google
Eye alt 4987.41 km


Guangzhou 广州市
Foshan 佛山市
Dongguan 东莞市
Huizhou 惠州市
Shunde 顺德区
Jiangmen 江门市
Zhongshan 中山市
Shenzhen 深圳市
Tai Po
Hong Kong
Tuen Mun
Zhujiang River Estuary
Chek Lap Kok
Kwun Tong
Hong Kong
Zhuhai 珠海市
Macau
Macau
Coloane
Macau
Wailinding Dao
Hengqin Dao
45 km
© 2011 Europa Technologies
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22°37'40.36" N 113°45'05.07" E elev -2 m
©2010 Google
Eye alt 152.84 km

Ten Major Infrastructure Projects to Boost Our Economy

Preamble

To [redacted] n the region, Hong Kong needs to accelerate our infrastructure development. To boost our economy in the next five years, we will accord higher priority to the development of industries that already enjoy a competitive advantage. Our aim is to maintain Hong Kong's status as an international centre of financial services, trade and shipping, as well as to develop on fronts such as financial services, logistics, tourism and information services.

The economic benefits brought about by accelerated infrastructure development are apparent. In the 1970s and 1990s, various large-scale infrastructure projects provided the momentum for Hong Kong to develop into a cosmopolitan city. Cross-boundary projects which strengthen our linkage with the Mainland and the region will further enhance Hong Kong's competitiveness on a global scale. Embarking on major infrastructure developments also creates ample employment opportunities and boosts our Gross Domestic Product.

In promoting economic development, our top priority is to consolidate Hong Kong's status as an international centre of financial services, trade and shipping. With the ardent support of the [redacted] we are confident of achieving this goal. The commencement of various infrastructure projects will also reinforce Hong Kong's leading position in tourism, creative industries, logistics as well as aviation and maritime services.

The 10 major infrastructure projects

Transportation Infrastructure

1. West Island Line and South Island Line
2. Sha Tin to Central Link
3. Tuen Mun Western Bypass & Tuen Mun-Chek Lap Kok Link

Cross-boundary Infrastructure Projects

4. Guangzhou-Shenzhen-Hong Kong Express Rail Link
5. HK-Zhuhai-Macao Bridge
6. HK-Shenzhen Airport Co-operation
7. HK-Shenzhen Joint Development of Lok Ma Chau Loop

New Urban Development Areas

8. West Kowloon Cultural District
9. Kai Tak Development Plan
10. New Development Areas

Transportation Infrastructure

Other than the coming projects as targeted in the 2007 Policy Address, a significant number of highway and railway projects were completed in the 2000s. These included the Route 8, Route 5, Castle Peak Road Extension, Deep Bay Link, the Shenzhen-Hong Kong Western Corridor, and other large-scale road improvement projects.

Railway projects being completed during the period include the West Rail, Tseung Kwan O Extension Line, Ma On Shan Line, East Rail Extension Line, Lok Ma Chau Line and the Kowloon Southern Link.

In the following slides it gives a brief review of the infrastructure projects being completed before the announcing of the recent 10 Major Infrastructure projects in 2007.

10 Airport Core Projects in 1990s for the construction of the new airport at Chek Lap Kok

Construction of new airport at Chek Lap Lok

Construction of the Chek Lap Lok airport

Construction of the Chek Lap Lok airport

Development of North Lantau

Tsing Ma Bridge as a major part of the Airport Core Project

The Ma Wan Viaduct – the linking section between the Tsing Ma and Kap Shui Mun Bridge

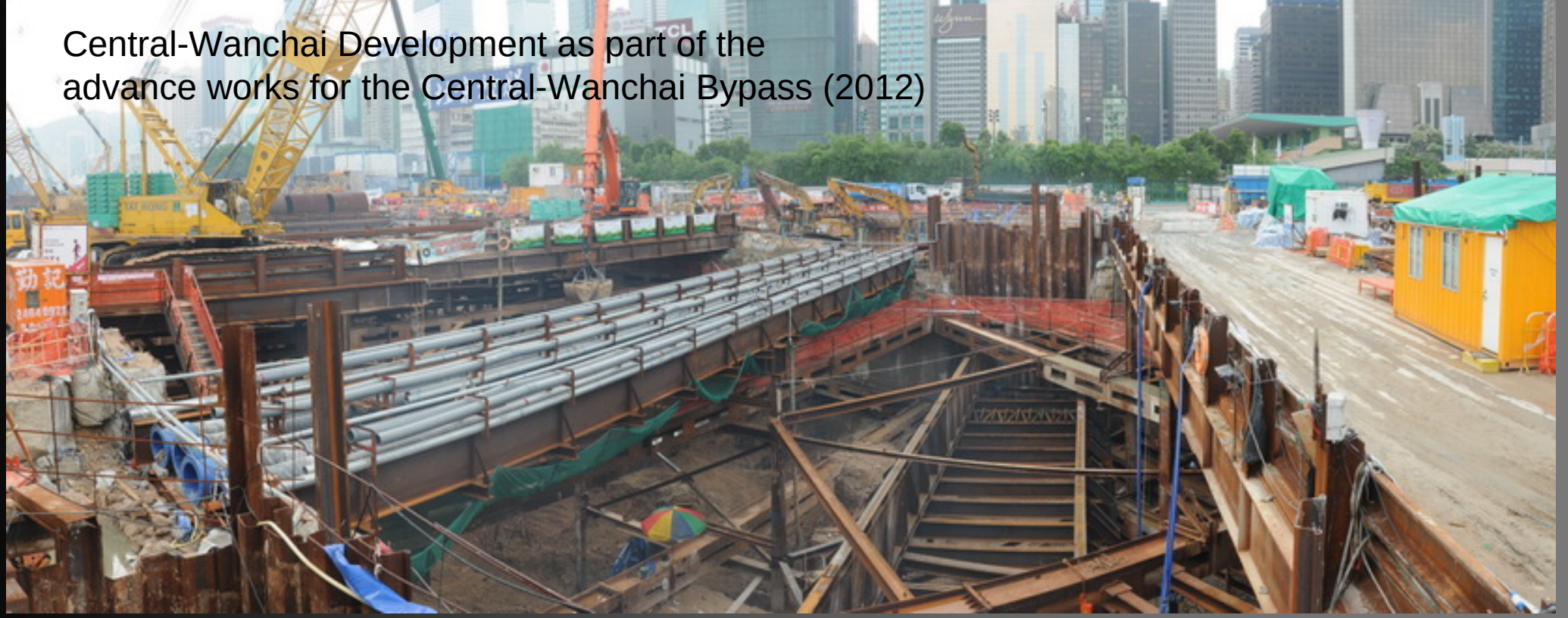
Central Reclamation in 1995

In fact, reclamation activities in Victoria Harbour almost without stop even after the 1990s. The few slides that followed show some of the reclamations forming part of Hong Kong's recent infrastructure developments

Central-Wanchai Reclamation in 2010

Central-Wanchai Reclamation in 2010

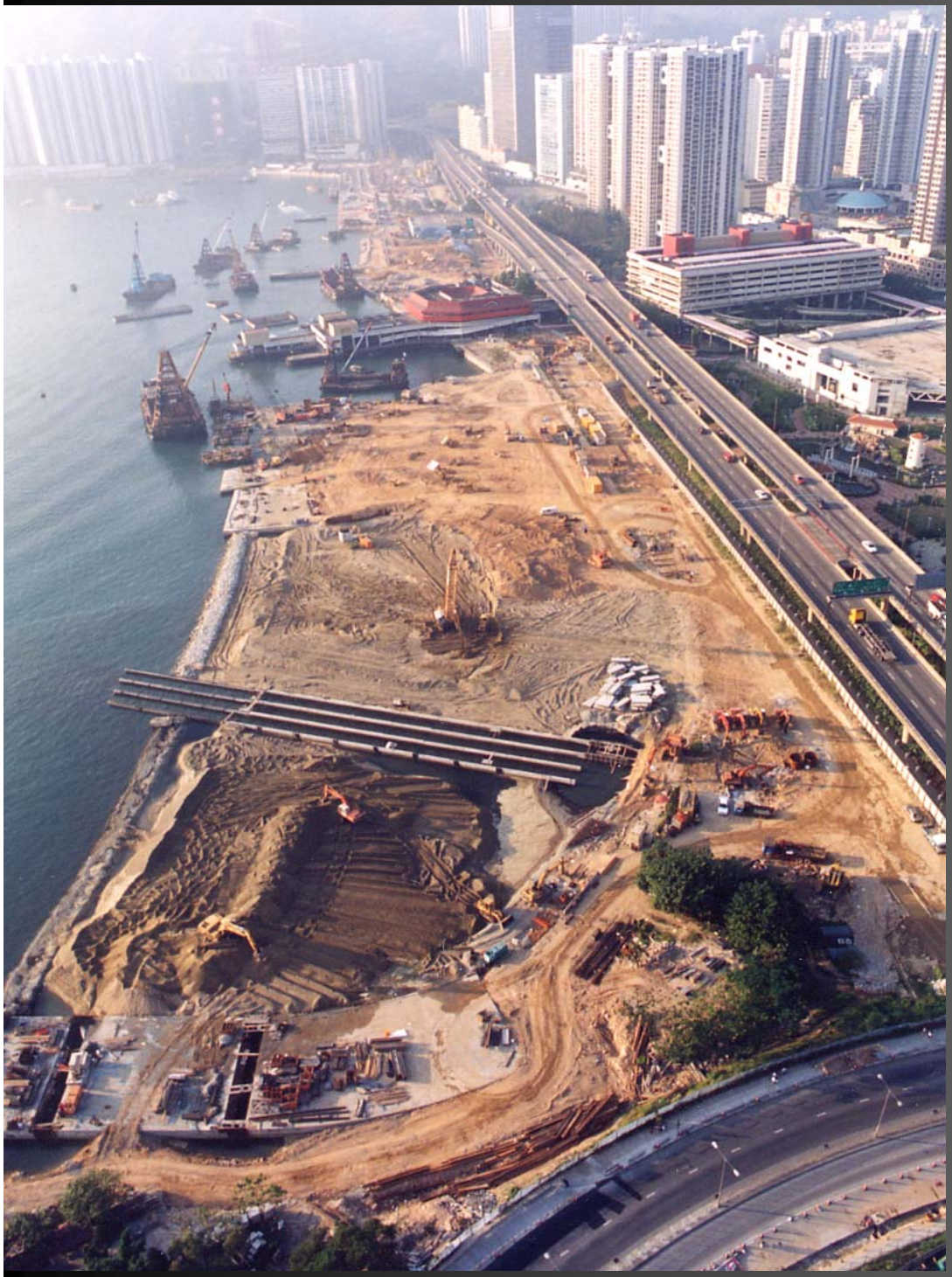
Central-Wanchai Development as part of the advance works for the Central-Wanchai Bypass (2012)



Central-Wanchai Development as part of the advance works for the Central-Wanchai Bypass (2012)

Central-Wanchai Development as part of the advance works for the Central-Wanchai Bypass (2012)

Construction
of West Rail



Construction of West Rail

Construction of West Rail

Container Terminal No 7 and 8 completed for operation in late 1990s
(photo taken in mid 2007)

Construction of Container Terminal 9

荔枝角高架路

• 自尖山隧道沿螺蝶谷而下至呈祥道一段，高度差距近180m，原是水塘排水及護林區的半處女地帶。在新建一條闊近40m的高架道路前，需作大規模的土地平整，自山谷中開出一段長500m、平均闊70m的地帶，其中包括多幅山坡的開削，作日後興建高架路之用。而且，還需開闢沿上而下的臨時施工道路，工程才能全面展開。(圖左上)

• 在同一谷段內，需要建造一組大型跌級式排水明渠，切面約5m x 8m，作為洩洪及水塘排水之用。(圖下)

• 全長近1,400m的三線相向高架路平均離地面15m，其本身已是一龐然大物，建造時大致採用預製箱梁件吊裝而成，吊裝時

此工程包括興建自尖山隧道出口大致沿螺蝶谷而下至三號幹線荔灣交匯處的一組長約1,400m的高架道路，和在呈祥道/青山公路及荔灣交匯處，接入區內的接引道路。

此段工程有以下數個具代表性的施工特點：

採用兩台長110m吊重100噸級的吊裝機組。高架橋平均跨度約60m，橋柱主要為"T"形墩形，在橫跨交匯口間加設有籠門架式的柱組，以容納地面交通。(左頁圖右上)

• 在呈祥道與青山公路交界處設有東西、南北行接引道路與高架路接駁，因地處高勢及沿呈祥道空間狹小，接引道路需削去部分山坡而過，在保持公路行車無間斷的形勢下施工，其困難可以想像。(圖左上)

• 在三號幹線荔灣交匯處亦設有一組接入道，因此段高架橋需接入另一段跨越三號幹線(西九龍快速公路)及機場快線的橋組，離地面近25m，層疊交錯，甚為壯觀。(圖右上及下)

Route 8 from Shatin to Tsing Yi

昂船州大橋

昂船州大橋設計屬於斜拉橋，主橋橋跨為1018m， 每邊由一高298m上窄下闊錐形(tapered)的主橋塔所承托，並透過224條鋼索組分成8個截面自橋塔向下拉緊橋身。鋼索組自每個橋塔分4個截面向橋面前後左右伸出，牢固在橋面的接承點上。因橋位於葵涌貨櫃港唯一入口，所以橋面離海平高達73.5m(青馬大橋為62m)，可容全球最大的貨櫃船通航。

• 大橋橋塔其一特點是上截牢固斜拉纜索的塔身為一不銹鋼外皮，內包強力鋼筋混凝土，組成承力結構的一部分。(圖左上)

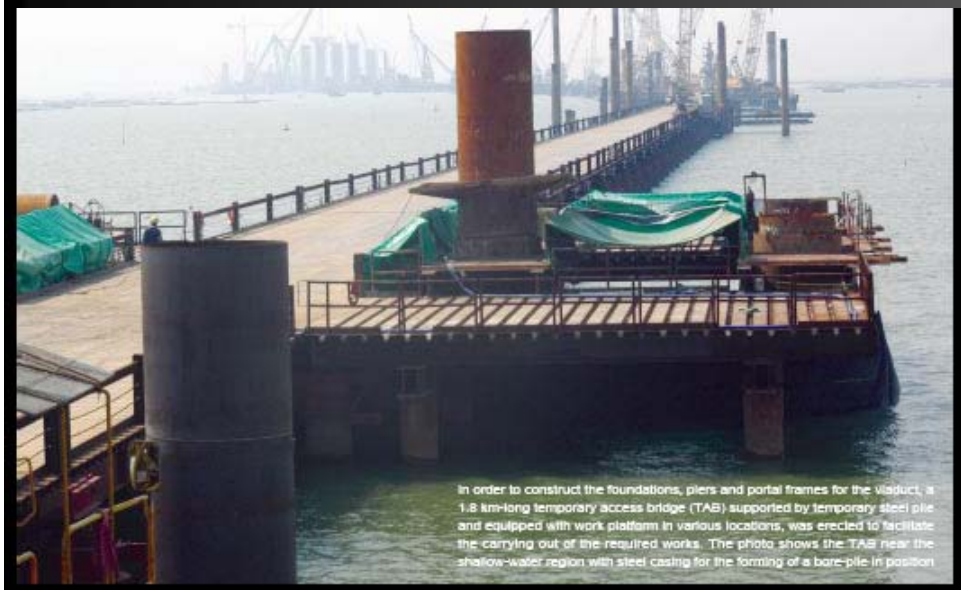
• 大橋橋面為鋼構件，闊約53m、高3.5m，平均重600噸。每個構件由上、下行車道從中加入承樑而成(twin box girder)。構件在河北省山海關市作初期製嵌，後運至廣東東莞作後期加工，最後用躉船運送到大橋現場水域，用裝置於橋面之兩組吊機提昇至橋面位置進行安裝。(左頁圖右上、下及左頁圖左上)

• 大橋兩端的副橋也是一組難度極高的工程。副橋接入主橋位置離地面平均68m，為四個跨段組成，每個跨段約70m，由"T"式單塔式柱座所承托，並採用大型台架支撐用分段現場澆製方式建造。由於工作高度及每個跨段重量極大，分段澆製期間每段的護吋加固安排，及穩定橋面結構的穩定等措施，均構成極大的施工困難。(圖左下及右下)

主橋東、西兩端為副橋，每邊由平均65m高的"T"形橋托所支撐，橋面用現場澆製加應力方式建造，橋身另一作用是為從主橋斜拉纜索產生的反應拉力提供對衡。副橋每邊分成四個跨段，跨距平均70m。

此段工程有以下數個具代表性的施工特點：

The Stonecutters Bridge and the approach linkages for Route 8 at Lai Chi Kok



In order to construct the foundations, piers and portal frames for the viaduct, a 1.8 km-long temporary access bridge (TAB) supported by temporary steel pile and equipped with work platform in various locations, was erected to facilitate the carrying out of the required works. The photo shows the TAB near the shallow-water region with steel casing for the forming of a bore-pile in position

HK-Shenzhen Western Corridor

Photo Essay by Raymond Wong Wai-man

Viewing towards Ngau Hom Shek (牛頸角) from one of the work station with the supporting temporary steel piles on the underside of the access roadway clearly seen. Since Deep Bay is environmentally sensitive, silt-screen was erected (photo centre) during the bore-pile forming process in order to avoid the pollution of the seawater by silt and mud

Close up view of a sheet-pile cofferdam at its formation level. The pile heads were exposed ready for the forming of the pile cap for the portal pier

Close-up view of a work station where a portal frame situated. All the equipments can be seen in working position for the forming of a bore-pile cluster

Viewing from the landside, the entire access roadway with most of the piers for the portal frames being completed. Part of the viaduct sections constructed with the help of launching gantries can be seen in various locations

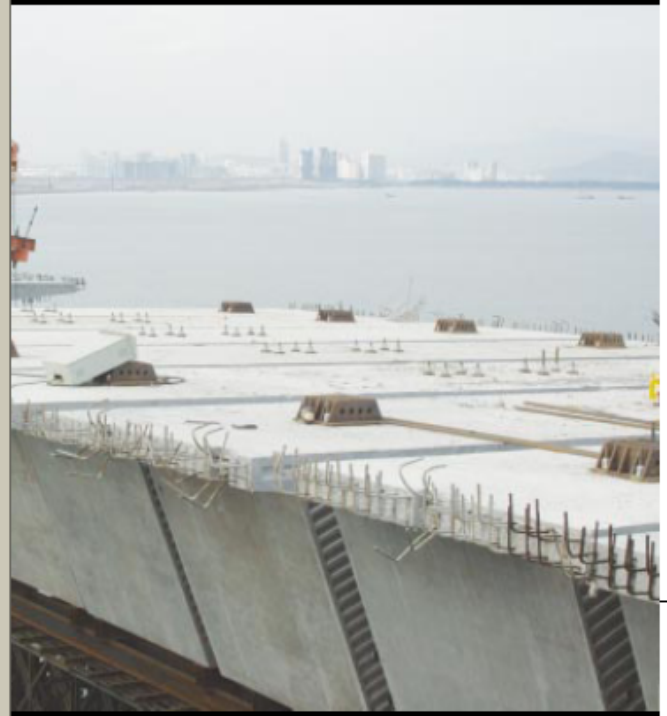
The first section of the portal pier ascending from the cap ready for the placing of the formwork for the onward pier section

The erection of the first set of launching gantry as seen in October 2004. The first span of viaduct formed in advance by balanced-cantilever method, was used as the work station to support the installation of the gantry

Launching gantry as viewed from sea-level under its operating condition. Note the team of servicing support formed by barges and other work boats stationed around the gantry to assist in the viaduct installation

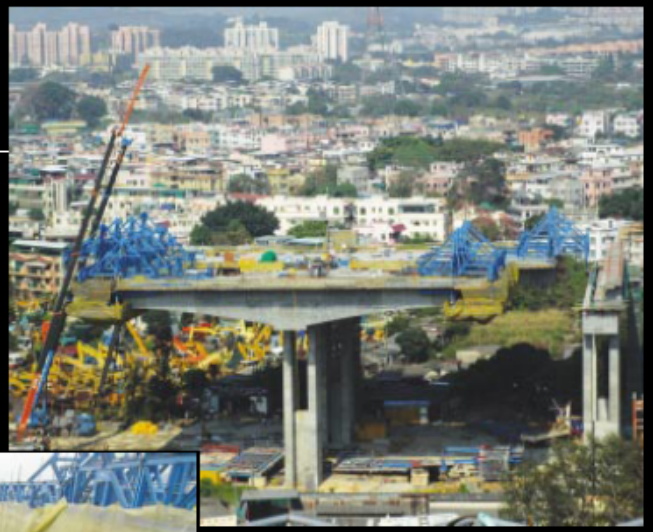
The construction setting of the China counterpart as seen from the northern tip of bridge toward China side

Viaduct and bridge structure basically completed as seen in late 2006. The temporary access bridge on the underside of the viaduct would soon be dismantled



Close up on the segment installation detail under the practice on China side. Similar lifting frame was also employed at the same time with the in-situ installation with precast segment placed onto falsework (temporary platform) for final connecting onto pier heads (photo left)

The final section of viaduct joining the Northern and Southern Sections of Deep Bay Link as view from the side. Just slightly outside the boundary of this photo, the elevated track of West Rail is on the left and Castle Peak Road is on the right, with a separating distance of about 250 m



Close up of a section of the viaduct constructed in balanced-cantilever arrangement using sets of girder-mounted traveling formwork on both ends. The village houses around Yick Yuen Chuen forms an impacting background showing the fragile nature of the project environment

From the viaduct viewing downward seeing a train rushing through the elevated track of West Rail. The gantry in blue on each side is the travelling formwork system used to cast the box-section deck of the viaduct in-situ

Panoramic view seeing the viaduct approaching the elevated track of West Rail from Yick Yuen Chuen and Ching Tsuen Wai before the crossing over. The portal frame on the right side is the joining section between the Northern and Southern Sections of Deep Bay Link

The completed viaduct section running above the West Rail as seen in early 2007

Partially completed viaduct as viewed from an elevated position on the platform of a launching gantry before Tsing Chuen Wai with the track of West Rail running crossing in the middle of photo

佐敦道隧道坑穴的開挖情況。右邊可見承托於擋土樁架上臨時搭建的單道。圖中的高架行人橋，有三組橋柱在隧道走線範圍內，開挖時需要作加固或臨時的保護

從高處所見位於佐敦區文昌街西面(右圖)及西九龍快速公路油麻地交匯處邊旁(上圖)的隧道開挖前期工作佈局

佐敦道行人橋開挖期間露出的橋柱，正等待稍後進行的加固工作

位於佐敦文昌街對出一組受影響需要加固和永久承托的來水管道

位於欽頌道自油麻地引出的大型排洪渠受隧道開挖影響需要分段進行改道及重鋪，以便隧道從其下而過

從佐敦道行人橋下望的一段隧道坑道。此段因在西九龍填海期間為一個策位置，地下設施密佈，所以在開挖時對設施所作的改動及重鋪安排，是工作的重點之一

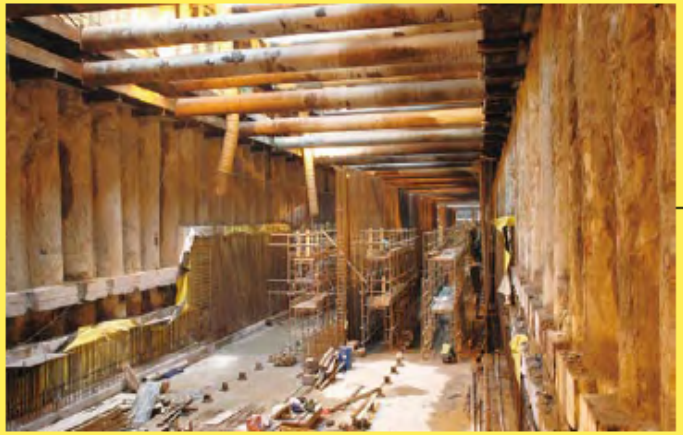
Kowloon Southern Link jointing the East and the West Rail

2001年從高空所見的西九龍快速公路大角咀交匯口及匯入奧運站方向的接入道（圖左）。圖中位於西鐵預留接駁旁的地塊，就是九龍南環線接入南昌站的終端

位於西九龍快速公路大角咀交匯處的南環線接入井口開挖及建造隧道管道的施工情景

在明挖坑道內所見的一個工作環境較特殊的情景。此坑道位於櫻桃街與連接道交界，西欲地鐵奧運站。坑道中之護土支撐為大口徑圓柱箱或鋼管樁。圖中左邊凹入的空間為櫻桃街地下通道(underpass)之底部，其間正進行橫越其底部的挖掘工作

在隧道坑道內完成挖掘後，坑底會分段鋪上一層厚1至1.5m由鋼筋混凝土所建之底墊層，完成後再用大板塊形式之橫板建隧道管壁及頂板。圖中可見由鋼管組成的坑道邊橫橫撐，形成足夠的工作高度及空間，以便隧道管道的建造



在接近柯士甸站之隧道管道因路軌與車站月台交接的轉軌安排，部分隧道需容納一管雙軌的佈局，以至管道切面更為廣闊。圖中為西九龍近海泓道的一段，可見在這種狹小的空間下工作的局限和施工安排

建造隧道管壁所用大板塊形式模板之施工特寫

建造隧道管頂板之施工特寫

The 10 Major Infrastructure Projects

-Transportation Infrastructure

South Island Line

Population including Southern and Western HK is about 0.32m. There is a strong demand to provide a new metro line to serve the District.

The Executive Council has given the approval to the MTR Corporation Limited for the construction of the South Island Line. Construction of the 7 Km rail line will start in 2011 and cost more than $7 billion.

Other data regarding Western Island Line:

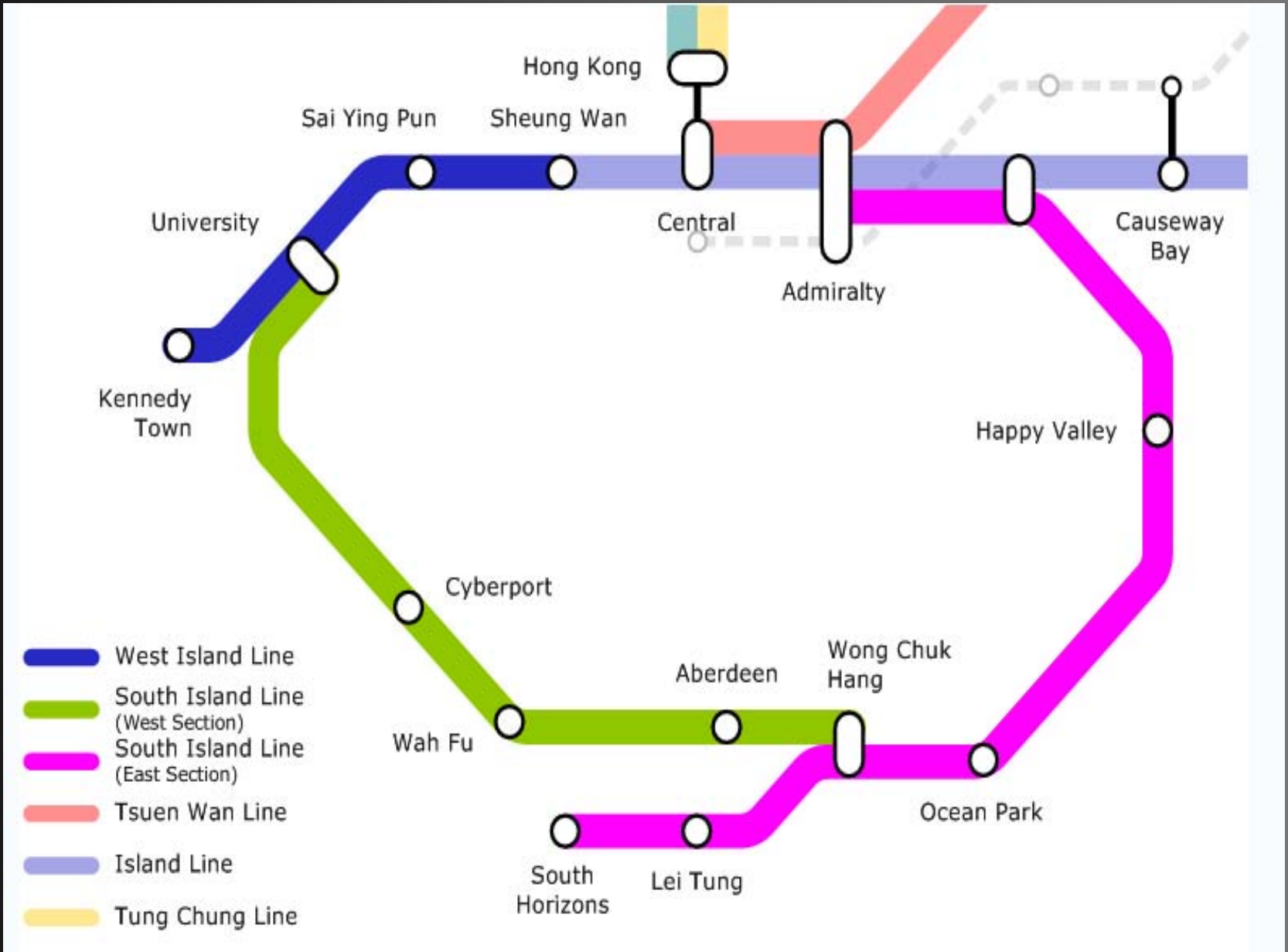
Obtain approval from government – October 2007

Expect time to obtain the final authorization under Railway Ordinance and other legislation procedure – early 2010

Commence detail design – 2009-2011

Commencement of construction – 2010

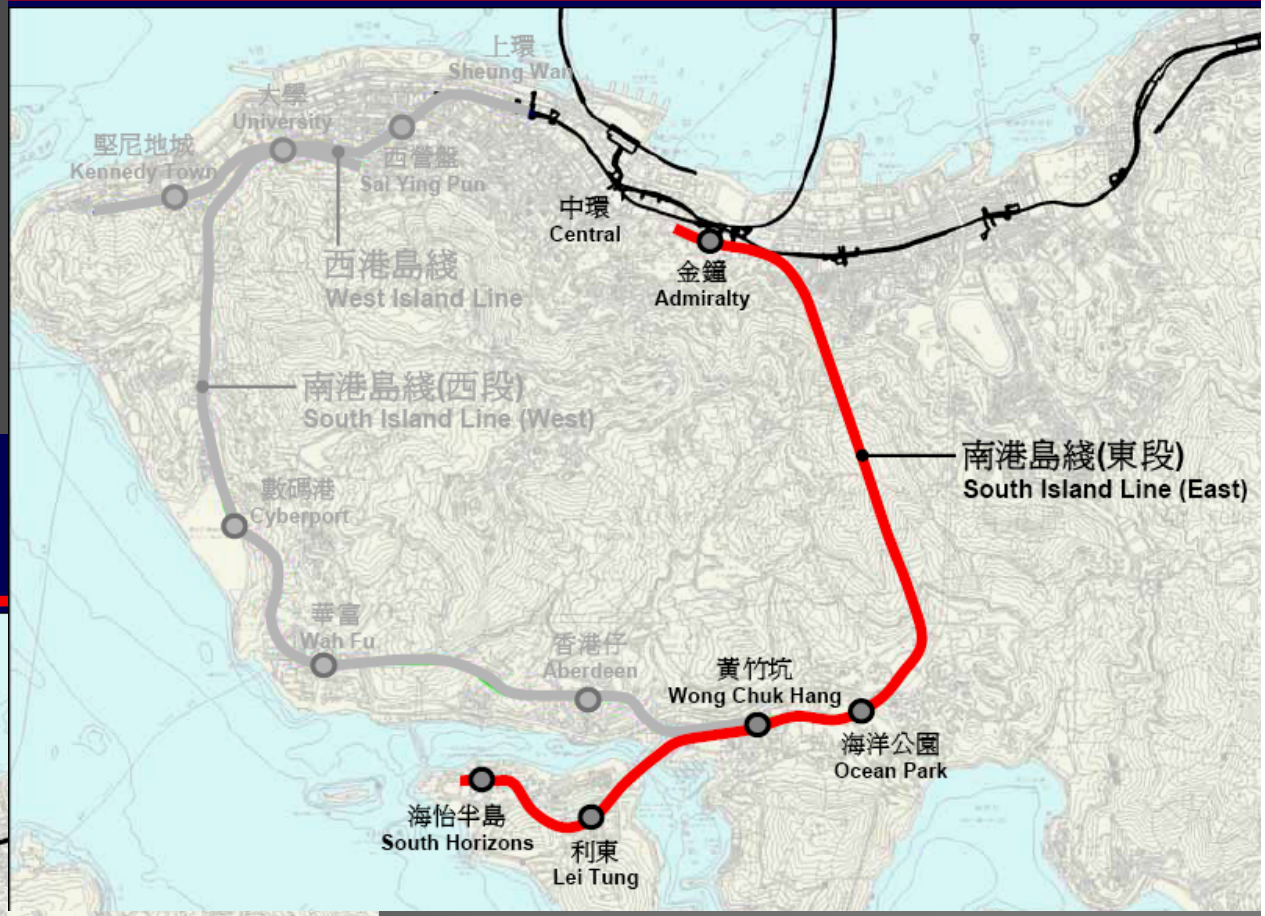
Completion for operation – late 2014



MTR West Island Line and South Island Line

(2005 proposal with Happy Valley Station)

South Island Line (East)



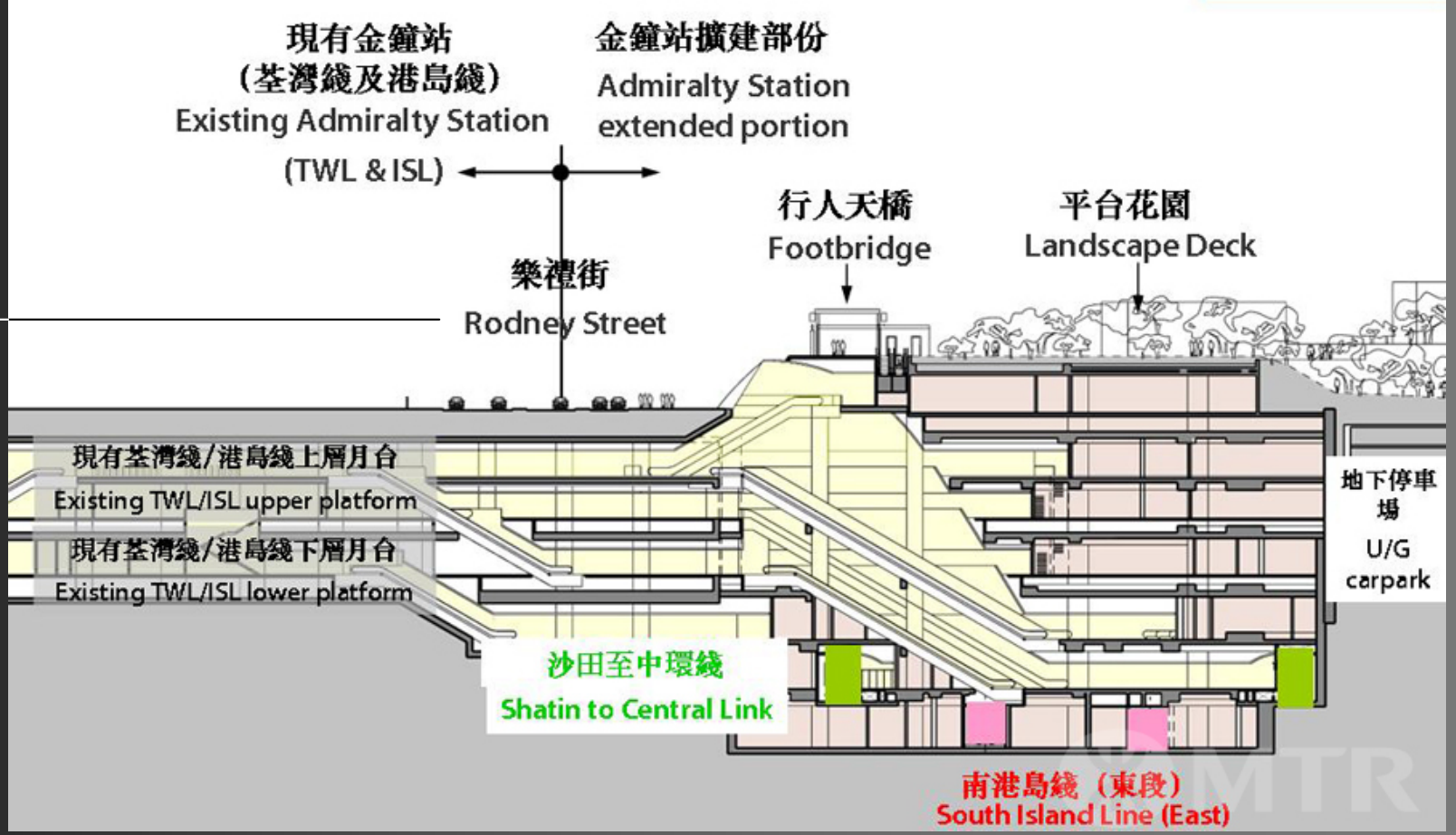
南港島綫(西段)
South Island Line (West)

South Island Line (East) – Indicative Alignment


Lei Tung
Ocean Park
South
Horizons

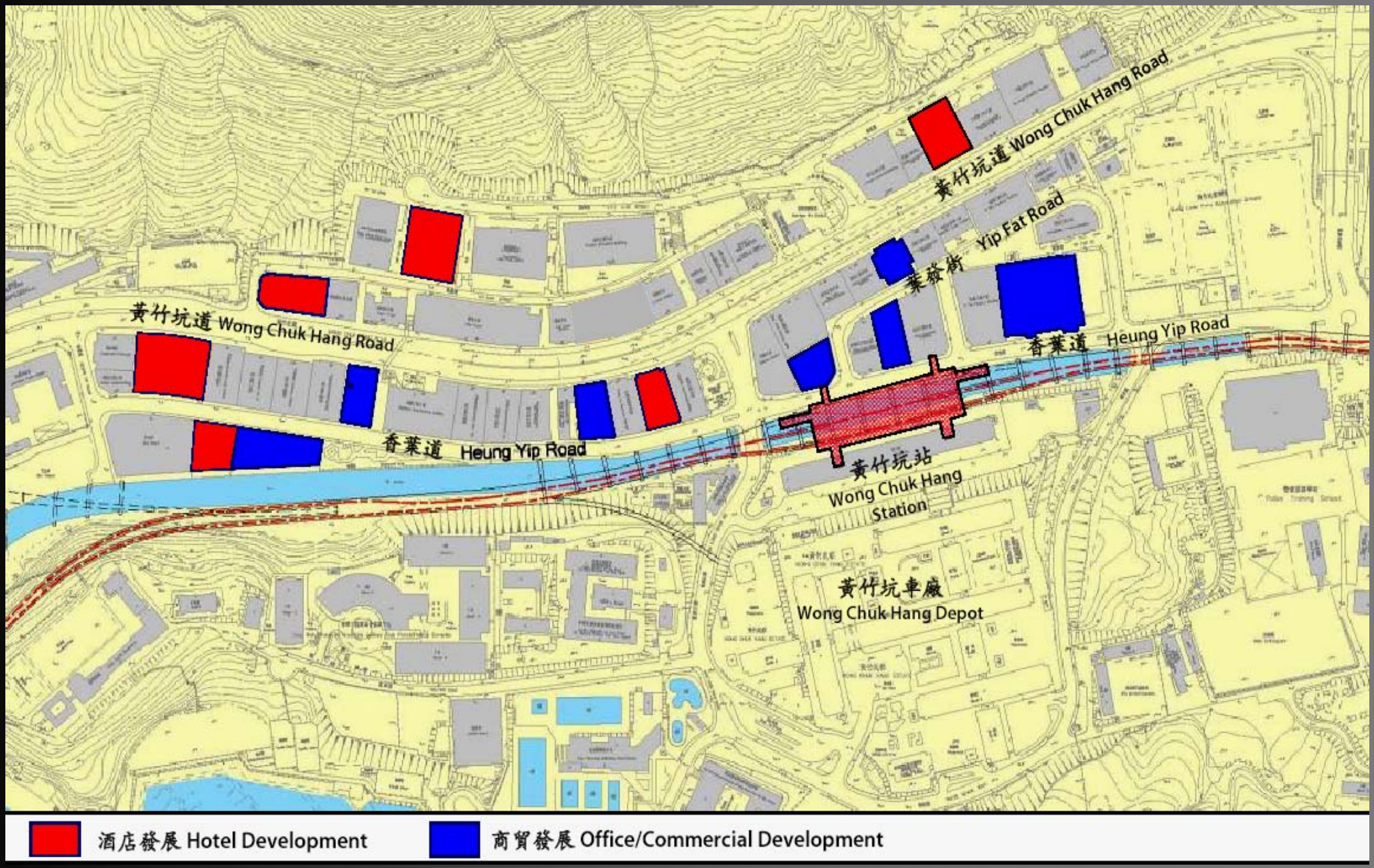

Wong Chuk Hang
(Interchanging) Station
Lei Tung Station
South Horizons Station
Aberdeen Station
Wah Fu Station
Cyberport Station
Sai Ying Pun Station
University Station
Kennedy Station
S Island Line West
S Island Line South

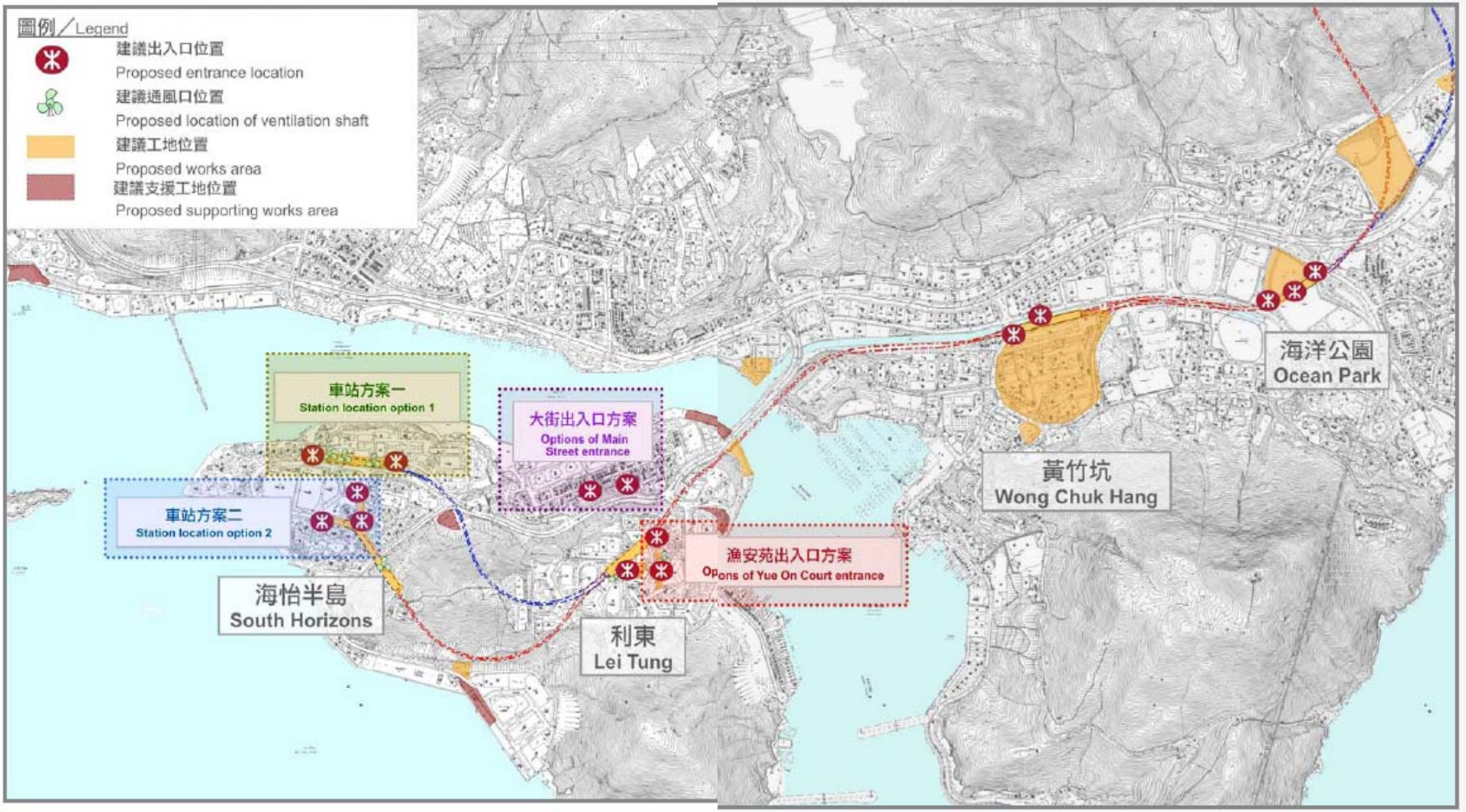

LIEBHERR
HS 885
320
CAT

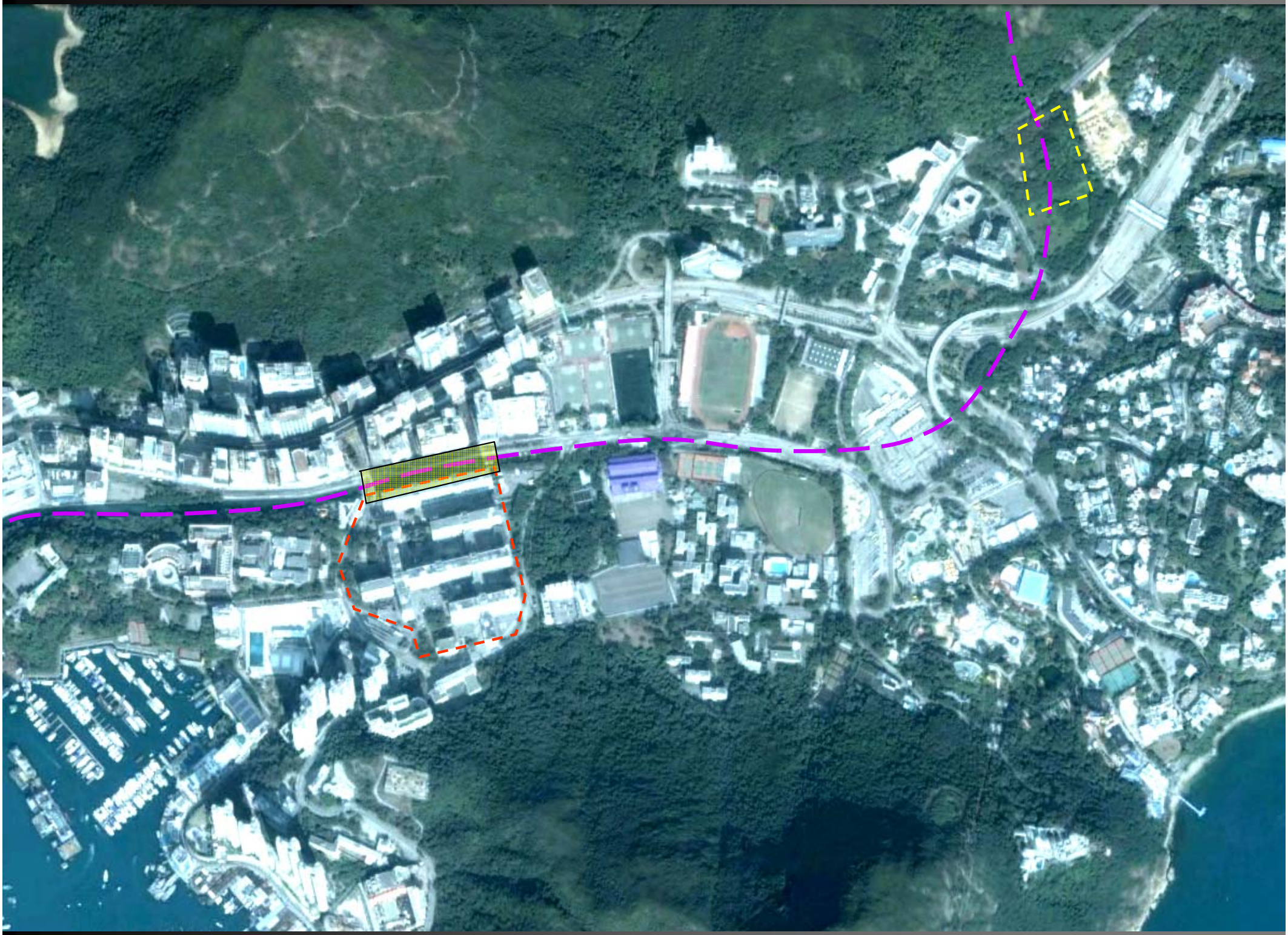

現有金鐘站
(荃灣綫及港島綫)
Existing Admiralty Station
(TWL & ISL)
金鐘站擴建部份
Admiralty Station
extended portion
行人天橋
Footbridge
平台花園
Landscape Deck
樂禮街
Rodney Street
現有荃灣綫/港島綫上層月台
Existing TWL/ISL upper platform
現有荃灣綫/港島綫下層月台
Existing TWL/ISL lower platform
地下停車場
U/G carpark
沙田至中環綫
Shatin to Central Link
南港島綫（東段）
South Island Line (East)

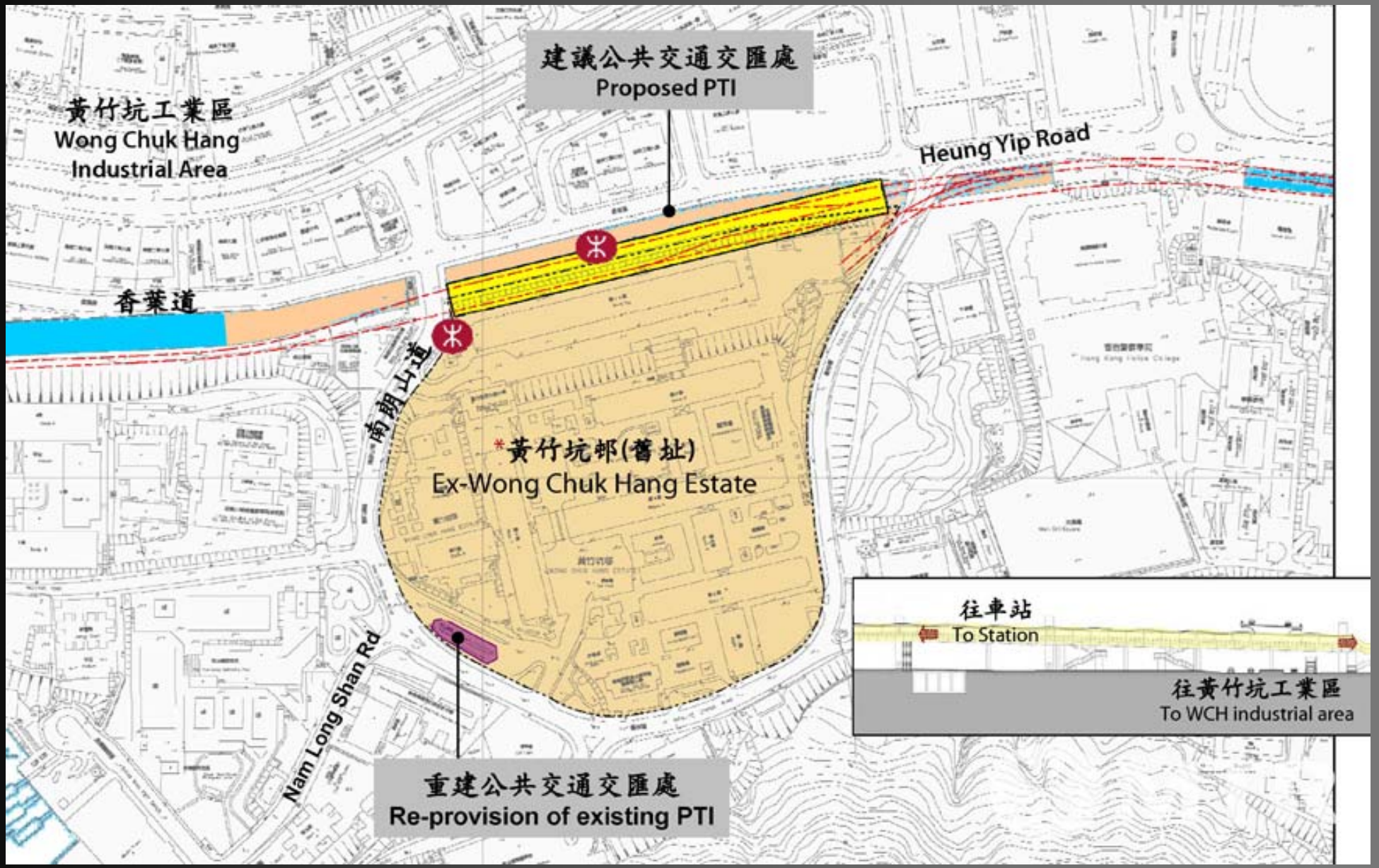
Approx. alignment of elevated rail track at Wong Chuk Hang

Alignment of South Island Line at Wong Chuk Hang



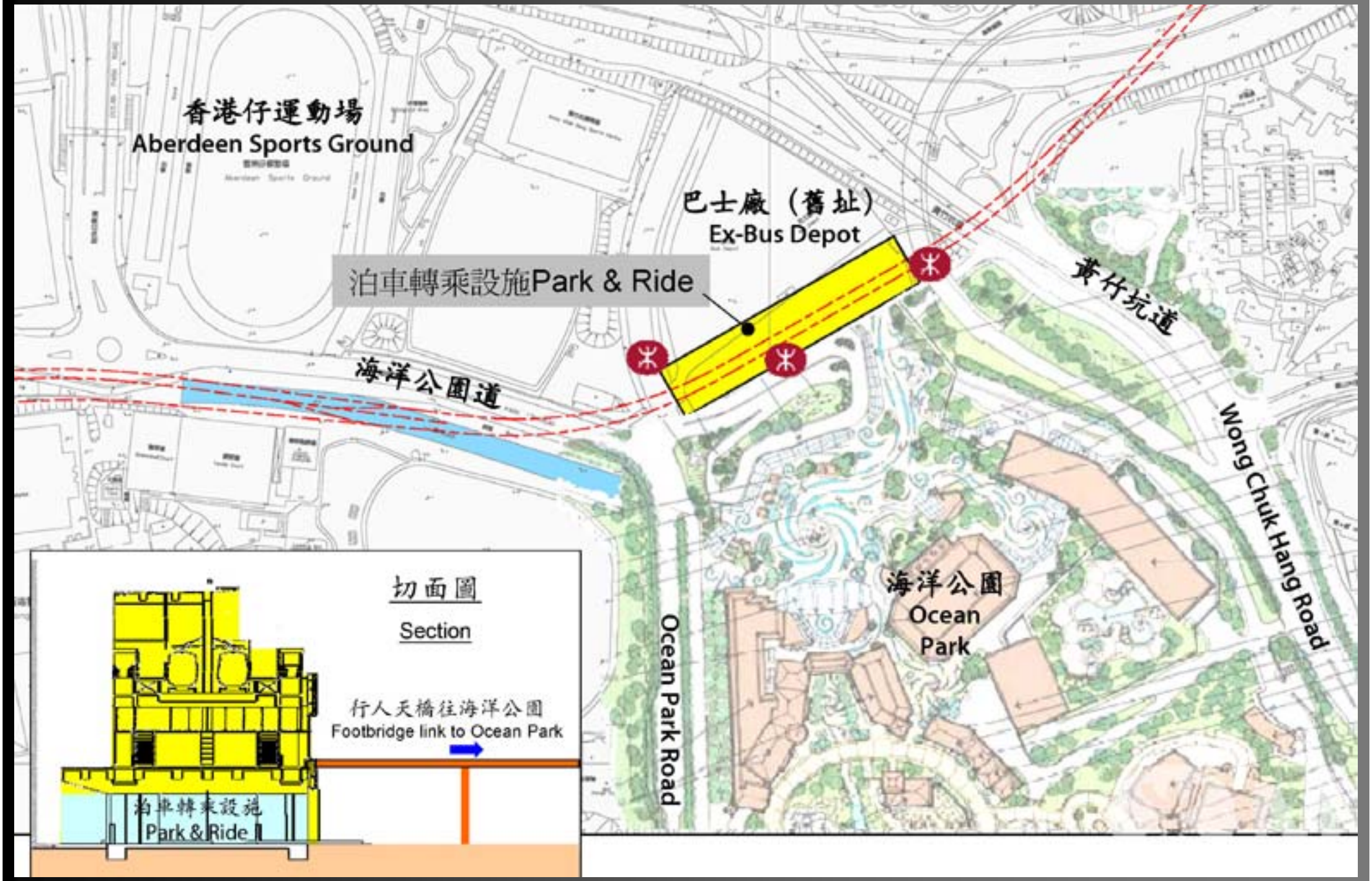

圖例／Legend
建議出入口位置
Proposed entrance location
建議通風口位置
Proposed location of ventilation shaft
建議工地位置
Proposed works area
建議支援工地位置
Proposed supporting works area
車站方案一
Station location option 1
車站方案二
Station location option 2
大街出入口方案
Options of Main Street entrance
漁安苑出入口方案
Options of Yue On Court entrance
海怡半島
South Horizons
利東
Lei Tung
黃竹坑
Wong Chuk Hang
海洋公園
Ocean Park




建議公共交通交匯處
Proposed PTI
黃竹坑工業區
Wong Chuk Hang
Industrial Area
Heung Yip Road
香葉道
南朗山道
*黃竹坑邨(舊址)
Ex-Wong Chuk Hang Estate
往車站
To Station
往黃竹坑工業區
To WCH industrial area
Nam Long Shan Rd
重建公共交通交匯處
Re-provision of existing PTI


Apleichau Main Street
鴨脷洲大街
Ap Lei Chau Bridge Road
漁安苑
Yue On
Estate
利東
Lei Tung
利東邨
Tung Estate


鴨脷洲邨
Ap Lei Chau Estate
海怡路
Horizons Drive
海怡半島
South Horizons
Lee Nam Road
利南道


香港仔運動場
Aberdeen Sports Ground
巴士廠（舊址）
Ex-Bus Depot
泊車轉乘設施Park & Ride
海洋公園道
黃竹坑道
Wong Chuk Hang Road
Ocean Park Road
海洋公園
Ocean
Park
切面圖
Section
行人天橋往海洋公園
Footbridge link to Ocean Park
泊車轉乘設施
Park & Ride

金鐘站

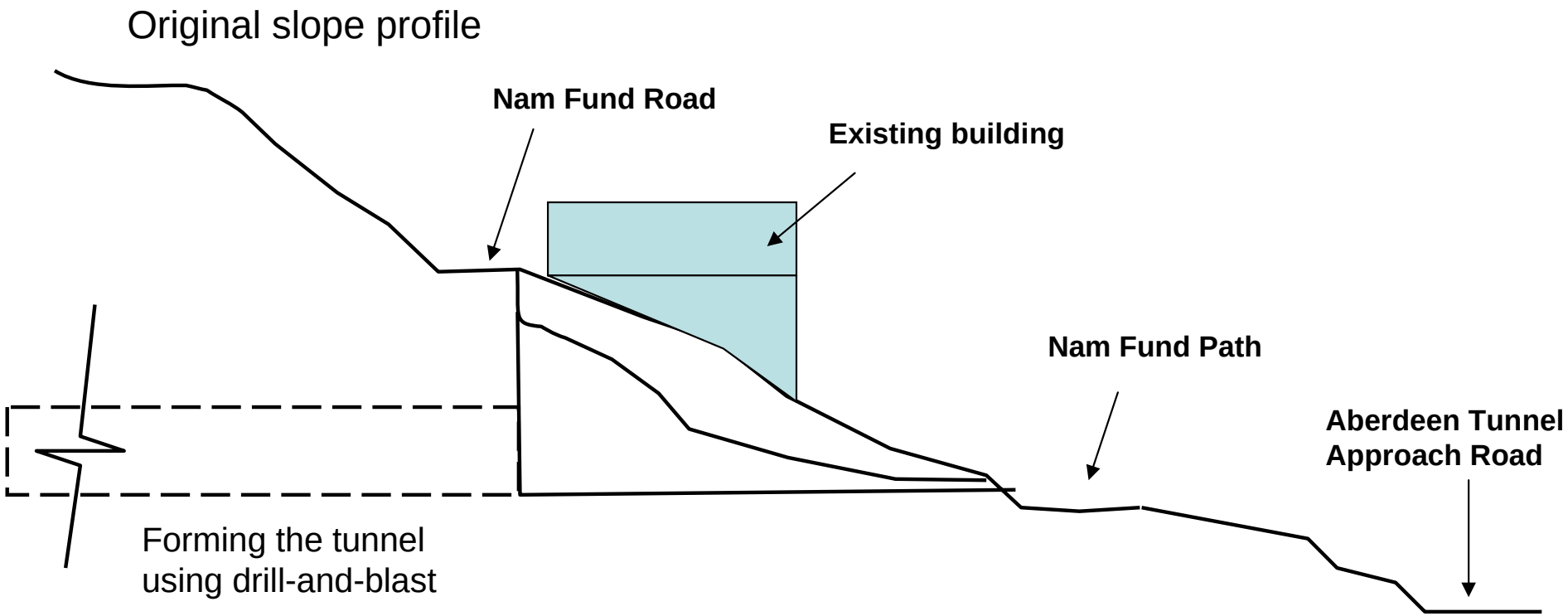
黃竹坑站

現貌

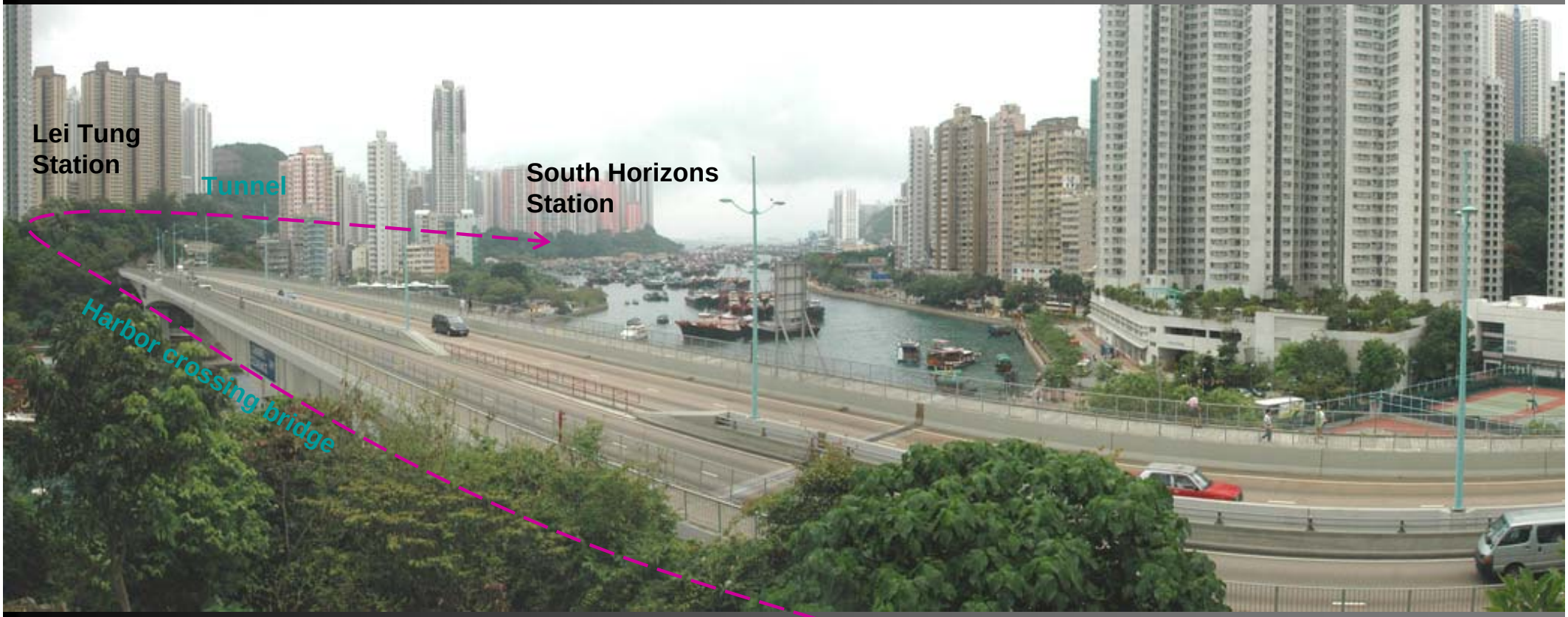
新貌

Urban environment of HK Southern district


Tunnel portal underneath
Nam Fung Road



Formation of the tunnel portal underneath Nam Fung Road


Lei Tung Station
Tunnel
South Horizons Station
Harbor crossing bridge
Approx. alignment of rail track
Elevated track
Track heading from Wong Chuk Hang Station


CHANNEL
CLEARANCE 14M

The forming of a tunnel portal as an advance work for large-size tunnel is often overlooked by outsiders. It may involves million cubic metre of cutting and slope stabilization works. Without which, the carrying out of the tunneling works no matter using what method, can hardly proceed.

This photo shows the formation of tunnel portal for the Nam Wan Tunnel of Route 8

The formation of tunnel portal for the Nam Wan Tunnel

Formation of tunnel portal for Tai Lam Tunnel of Route 3, Ting Kau

Formation of tunnel portal for
Tai Lam Tunnel (TW side), West Rail