Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030

# Land Supply Considerations and Approach

PLANNING DEPARTMENT
HKSARG
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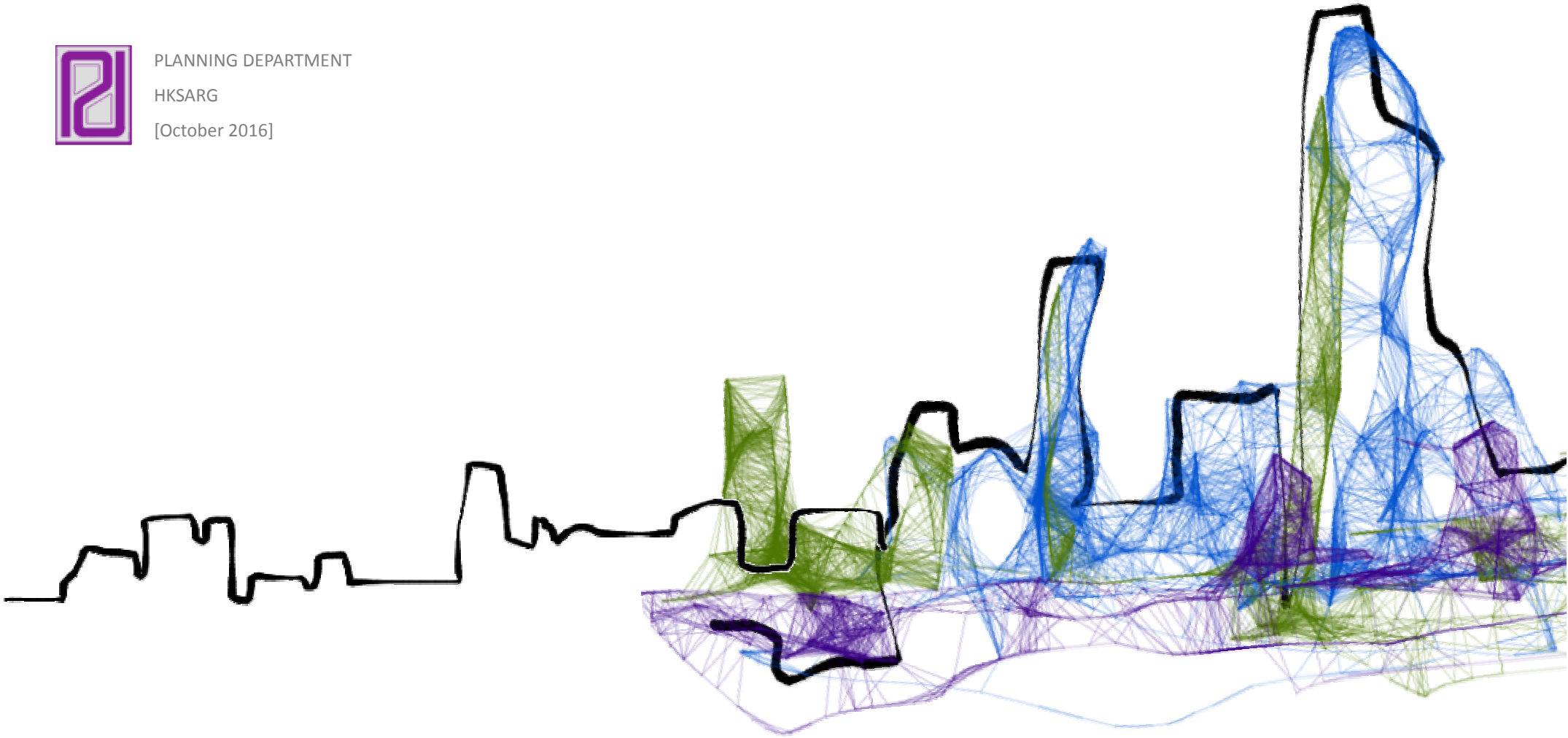

*This topical paper constitutes part of the research series under "Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030" (Hong Kong 2030+). The findings and proposals of the paper form the basis of the draft updated territorial development strategy which is set out in the Public Engagement Booklet of Hong Kong 2030+.*

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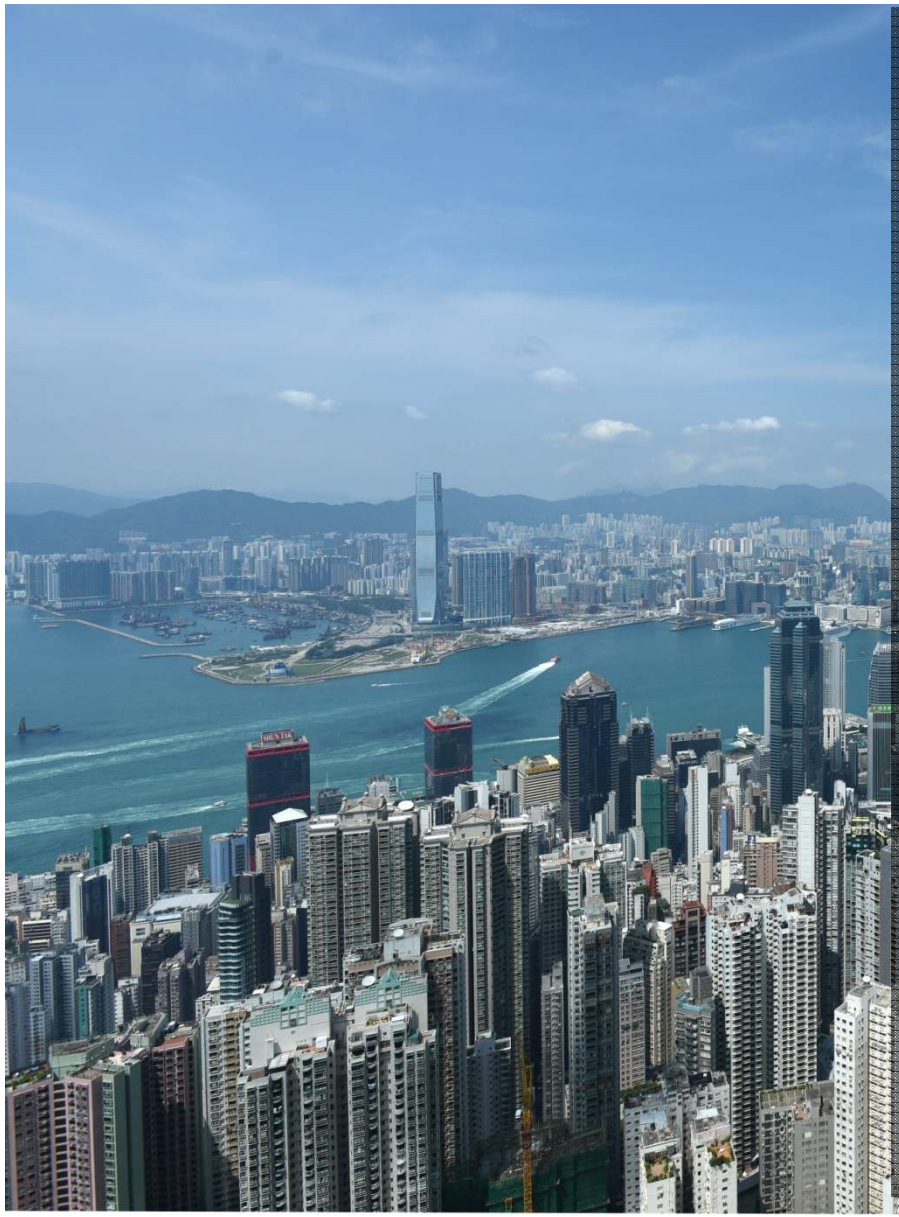


# PREFACE

Land is the carrier of many activities, and an essential resource for bolstering social and economic development of a city and improving the quality of living. We shall create land and optimize the use of precious land smartly.

Given the scarce land resource and hilly topography of Hong Kong, we need a holistic strategy to identify suitable and sufficient developable land to accommodate needs emerging from population and economic growth. This paper analyses the major challenges in land development in Hong Kong, proposes a multi-pronged approach for creating development capacity, and sets out considerations for prioritising land supply sources and key strategic directions and actions for future land supply. This provides the foundation for creating capacity for sustainable growth, which is one of the building blocks under **Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 (Hong Kong 2030+).**

# 1 An Overview of the Land and Waters in Hong Kong

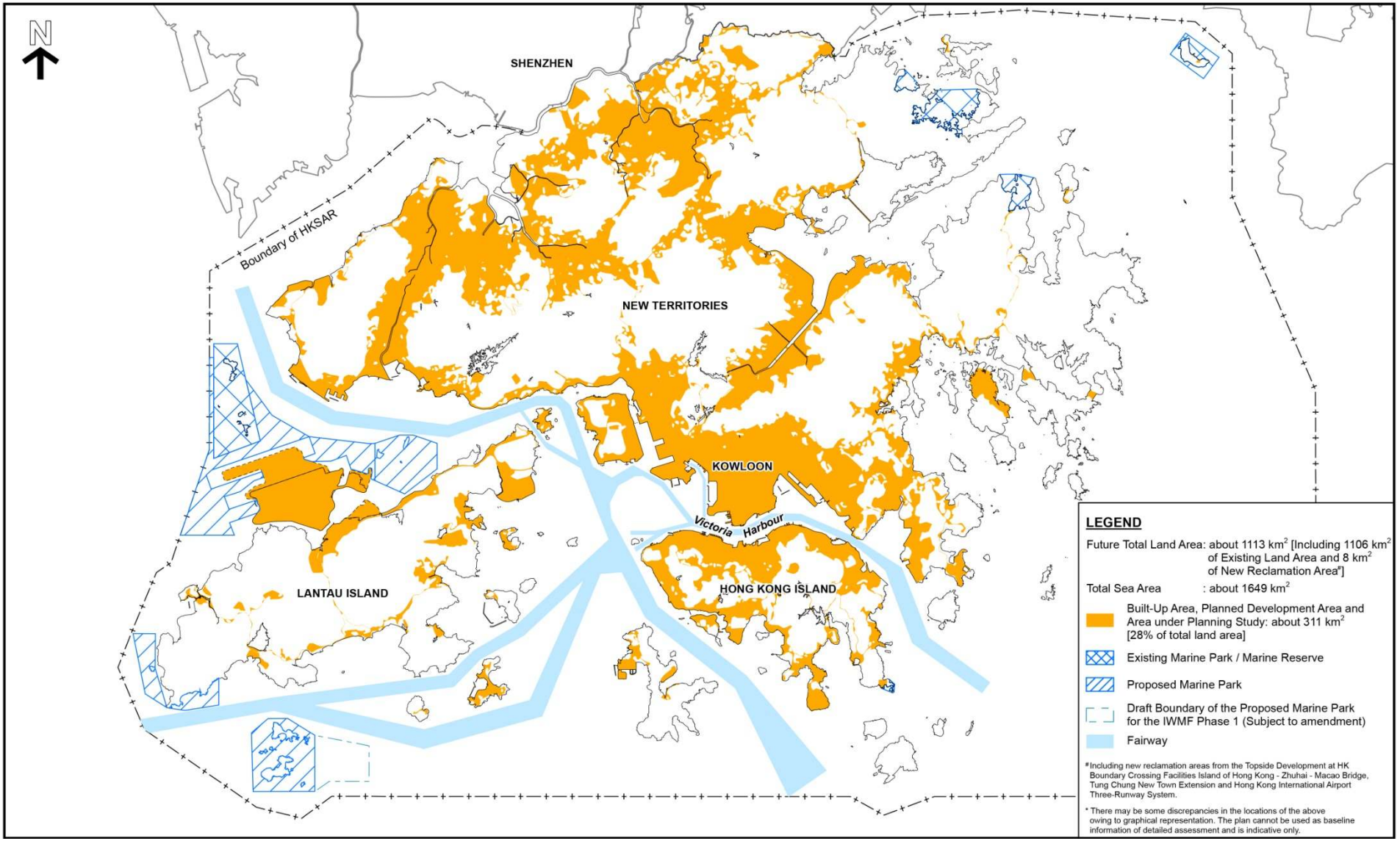
1.1 The total land area of Hong Kong is about 1 106 km$^2$ [1], of which about 268 km$^2$ or 24% are existing built-up areas[2]. Together with the planned development areas and areas under planning studies[3], the built-up areas will be expanded to about 311 km$^2$ or 28% of the total land area **(Figure 1)**. The majority of the remaining 72% land area comprises natural assets, environmentally/ ecologically sensitive areas, hilly terrain, etc. The sea area (about 1 649 km$^2$) encompasses our working harbour, fairways, natural heritage as well as ecologically sensitive marine habitats.

[1] This figure is based on the existing coastline and does not include mangrove and swamp areas below the High Water Mark.

[2] The **existing built-up areas** include residential, commercial, industrial, institutional, open space, transport land use and other urban area or built-up land, and the figure derived from the land use data under 'Land Utilization in Hong Kong 2015' which has been compiled using satellite images, in-house survey information of the Planning Department and other relevant information from various government departments.

[3] **Planned development areas** include areas under development zones on statutory plans which are not covered by built-up areas. **Areas under planning studies** include the committed, planned and under advanced planning short-to-long term land supply, e.g. Ex-Anderson Road Quarry, Former Diamond Hill Squatter Areas, Ex-Cha Kwo Ling Kaolin Mine, Ex-Lamma Quarry, Fanling North New Development Area (NDA), Kwu Tung North NDA, Kwu Tung South, the Loop, Hung Shui Kiu NDA, Yuen Long South, Kam Tin South, North Commercial District on Airport Island, Tuen Mun Areas 40 and 46, Kai Tak Development and Kowloon East and Tseung Kwan O Area 137. These also include studies involving new reclamation areas, namely the Topside Development at Hong Kong Boundary Crossing Facilities Island of Hong Kong-Zhuhai-Macao Bridge, Tung Chung New Town Extension and Hong Kong International Airport Three-Runway System. New Territories North, East Lantau Metropolis, small-scale and scattered sites such as potential housing sites through land-use review/ rezoning and other proposed near-shore reclamations subject to further studies are excluded. Some areas under planning studies overlap with the built-up areas or planned development areas.

## Figure 1 An Overview of the Land and Waters in Hong Kong



# 2 Major Challenges in Land Development

2.1 Land suitable for development is indeed limited in Hong Kong as many areas are endowed with valuable ecological, landscape and historical/ cultural assets, and/ or subject to technical, infrastructural and security considerations, which are generally not suitable for development **(Figure 2 and Table 1)**.

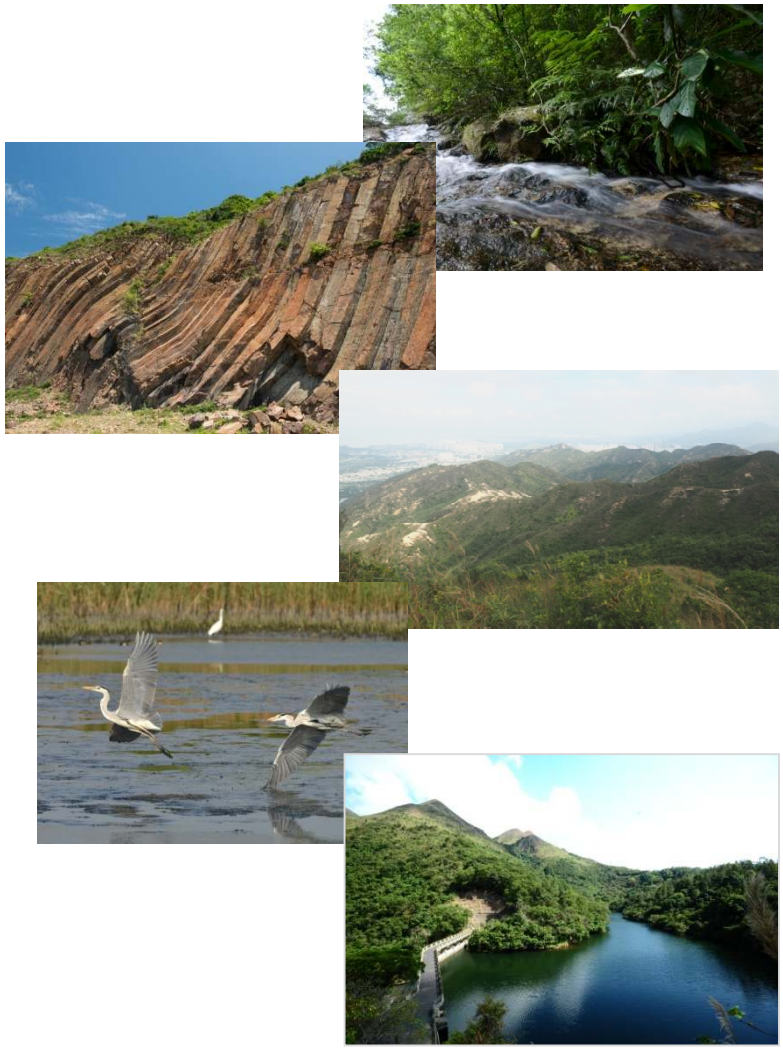
2.2 Most of the ecological, landscape and historical/ cultural assets are within or already designated as various conservation and protection areas or zones. About 443 $km^2$ or 40% of land area is designated under the Country Parks Ordinance (Cap.208) as Country Parks and Special Areas in Hong Kong. These areas perform multi-functions. Apart from providing habitats for wildlife, these areas also provide countryside recreation and outdoor education for the public. Vast areas of water catchments, reservoirs and hydrographic features ensuring the availability of local source of fresh water, as well as woodland performing carbon sequestration function and hence mitigating climate change and urban heat island effect are also within these areas. In addition, a number of declared monuments, graded historic buildings, archaeological sites and permitted burial grounds are also present in country parks. Most country parks have no proper vehicular access and inadequate provision of supporting infrastructure. For areas relatively close to the existing developed areas, some are fragmented, in irregular shape or adjoin the "Green Belt" zone.

2.3 Sizeable land areas of Hong Kong have been designated as Sites of Special Scientific Interest (SSSI) for the protection and conservation of areas of geological, ecological or botanical/ biological interests; Conservation Areas (CA) for the protection of natural landscape, ecological or topographical features; Coastal Protection Area (CPA) for the conservation and protection of natural coastlines and sensitive coastal natural environment; Restricted Areas for restricting access to designated areas of widlife habitat; and Wetland Conservation Area (WCA) for conserving the ecological value of the fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area. The existing protected and preserved areas (including Country Parks and Special Areas, Restricted Areas, SSSI, CA, CPA, WCA and Ramsar Site) cover about 540 $km^2$ of land in Hong Kong[4]. If the Government takes forward the designation of the proposed Robin's Nest Country Park and the Long Valley Natural Park, the protected areas will increase to about 545 $km^2$. Other areas endowed with ecological, landscape and historical/ cultural assets such as woodland, declared monuments, graded historic buildings and sites of archaeological interests, should also be duly respected and preserved.

[4] Some protected and preserved areas overlap with each other. For example, a large part of the Ramsar Site is under "SSSI" and "CA" while the core part of the site is also listed as Restricted Area (Mai Po Marshes Restricted Area).

2.4 The mountainous topography of our city poses another major challenge for land development. About half of our land is hilly with a slope gradient larger than 20°. About 20% of our land even has a gradient of 30° or larger. Although hilly terrain with gradient larger than 20° is not an insurmountable development constraint, developing such areas will generally incur a higher cost in site formation and construction and is usually not cost effective and/ or technically difficult to have large-scale development. Moreover, these areas in general have no proper road access and/or infrastructure facilities because of their hilly terrain and therefore are not suitable for large-scale development. Besides, for new developments in these areas, natural terrain landslide hazards may need to be studied and suitable mitigation measures should be provided where necessary as part of the developments.

2.5 For other technical and infrastructural constraints such as Potentially Hazardous Installations (PHIs) and their consultation zones[5] (CZs) and remote islands, although they are not absolute or insurmountable development constraints, the possibility of developing these areas is subject to detailed assessments and feasibility studies, availability of feasible relocation sites, technically viable alternatives, and innovative measures for mitigation and/or considerations of cost-effectiveness and worthiness. For areas of security considerations, designating military sites and closed area are control measures serving specific and necessary purposes and therefore should continue to be preserved.



[5] Consultation zone is delineated for each Potentially Hazardous Installation within which proposed development will be referred to Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations for consultation. Extent and size of a consultation zone is determined with regard to local variation in topography, the types of PHI and their storage capacities.

**Figure 2 Major Challenges in Land Development**

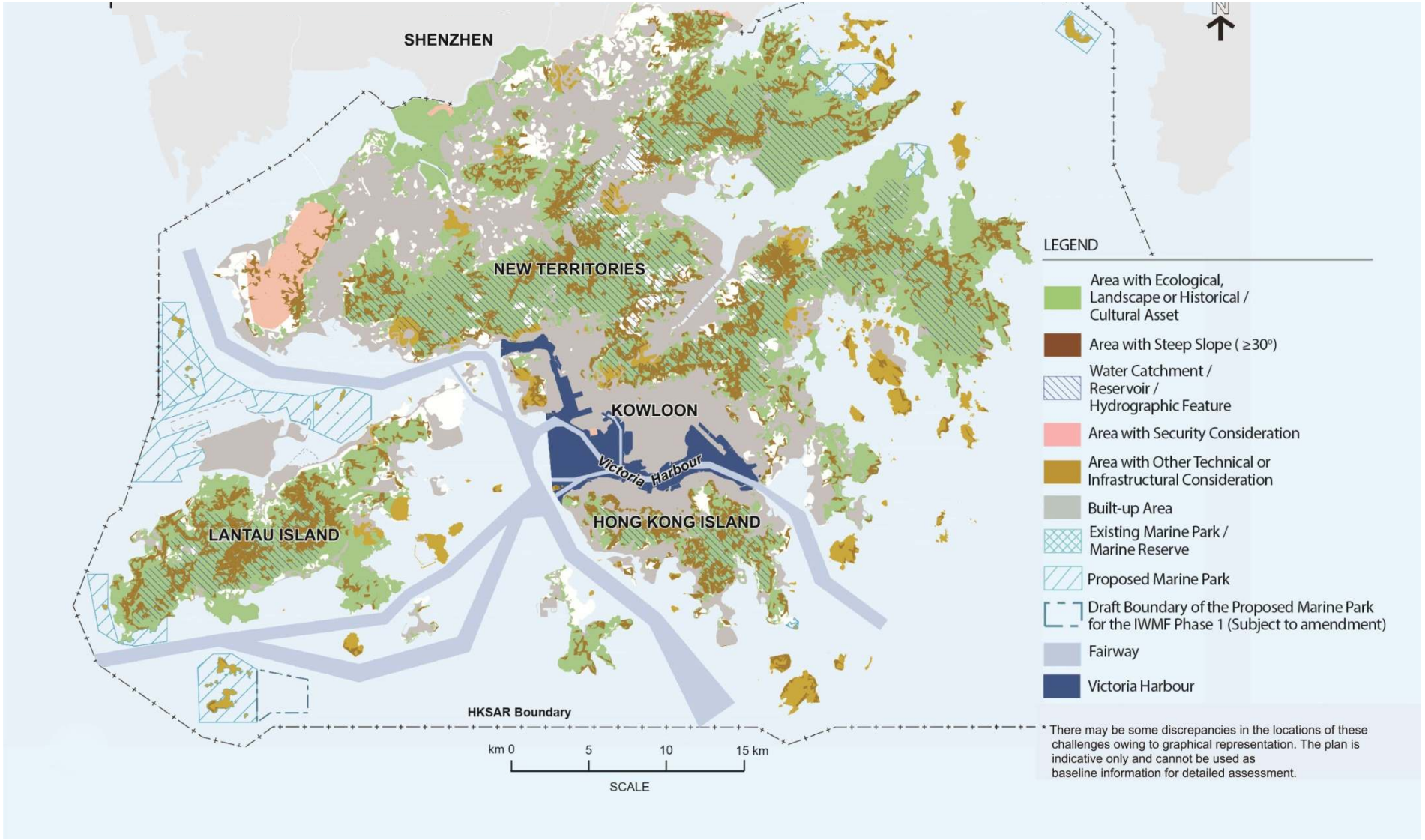


**Table 1 Major Challenges in Land Development: Sensitive and Challenging Areas[6]**

| Sensitive and Challenging Areas | Considerations |
|---|---|
| ***Areas with Ecological, Landscape & Historical/ Cultural Assets*** | |
| **Country Parks and Special Areas** | • Protected by the Country Parks Ordinance (Cap. 208), which provides a legal framework for the designation, development and management of Country Parks and Special Areas<br>• Designated for the purposes of nature conservation, countryside recreation and outdoor education<br>• Comprise vast areas of water catchments, reservoirs and hydrographic features ensuring the availability of local source of fresh water, as well as woodland performing carbon sequestration function, hence mitigating climate change and urban heat island effect<br>• A number of declared monuments, graded historic buildings, archaeological sites and permitted burial grounds are present |
| **Sites of Special Scientific Interest** | • Comprise terrestrial or marine sites which are of special scientific interest such as rare or particular species of fauna and flora and their habitats, corals, woodlands, marshes or areas of geological, ecological or botanical/biological interests for protection and conservation<br>• No new development will normally be permitted unless it is necessary for conservation of the site |
| **Conservation Areas** | • Protect and retain the existing natural landscape, ecological or topographical features of the area for conservation, educational and research purposes<br>• Separate sensitive natural environment such as Sites of Special Scientific Interest or Country Parks from the adverse effects of development<br>• There is a general presumption against development in these areas |
| **Coastal Protection Areas** | • Conserve, protect and retain the natural coastlines and the sensitive coastal natural environment, including attractive geological features, physical landform or area of high landscape, scenic or ecological value, with a minimum of built development<br>• Cover areas which serve as natural protection areas sheltering nearby development against the effects of coastal erosion, with a general presumption against development |
| **Ramsar Site** | • Include an estuarine inter-tidal mudflat backed by dwarf mangroves, shrimp ponds and fishponds in the Mai Po Marshes and Inner Deep Bay area<br>• Listed as 'Wetland of International Importance' under the Ramsar Convention**,** a formal recognition of the international importance of the unique ecological value of its wetland habitats |

[6] Some sensitive and challenging areas overlap with each other.

| Sensitive and Challenging Areas | Considerations |
|---|---|
| **Restricted Areas** | • Designated under the Wild Animals Protection Ordinance (Cap.170) for restricting access to designated areas of wildlife habitat<br>• Comprise important wildlife habitats at Mai Po Marshes, Yim Tso Ha Egretry and Sham Wan of the Lamma Island |
| **Wetland Conservation Area** | • Conserve the ecological value of the fish ponds which form an integral part of the wetland ecosystem in the Deep Bay Area<br>• New development would not be allowed unless it is required to support the conservation of the ecological value of the area or the development is an essential infrastructural project with overriding public interest |
| **Woodland** | • Function as carbon sequestration which contribute to low carbon living<br>• Habitat of wildlife and serve as important amenity for the public<br>• Fung Shui Wood is a unique landscape and ecological feature in South China as important asset from conservation, botanical and cultural points of view |

| Sensitive and Challenging Areas | Considerations |
|---|---|
| **Declared Monuments** | • Include any place, building, site or structure which the Antiquities Authority (i.e. Secretary for Development) considers to be of public interest by reason of its historical, archaeological or palaeontological significance declared to be a monument under the Antiquities and Monuments Ordinance (Cap.53) for protection<br>• No person shall excavate, carry on building or other works, plant or fell trees, or deposit earth or refuse on or in a monument; or demolish, remove, obstruct, deface or interfere with a monument, except in accordance with a permit granted by the Antiquities Authority. |
| **Graded Historic Buildings and Archaeological Sites** | • Assign Grade 1, 2 or 3 status to historic buildings according to their heritage value. Graded historic buildings are protected by means of administrative actions through prior consultation with the Commissioner for Heritage's Office of the Development Bureau and the Antiquities and Monuments Office of the Leisure and Cultural Services Department<br>• Archaeological sites include ancient architectural remains, kilns, hearths, rock carvings, farm lands, refuse mounds and footprints of ancient human beings, etc. Some sites receive statutory protection under the Antiquities and Monuments Ordinance (Cap.53) while the remaining are protected by means of administrative actions through prior consultation with the Antiquities and Monuments Office |

| Sensitive and Challenging Areas | Considerations |
|---|---|
| **Permitted Burial Grounds** | • Customary rights and interests of the indigenous inhabitants<br>• Some permitted burial grounds are within Country Parks |
| ***Technical and Infrastructural Considerations*** | |
| **Steep Slopes** | • Higher cost in site formation and construction<br>• Have no proper road access/ infrastructure facilities<br>• Not suitable for large-scale development<br>• For new developments within or in close proximity of natural hillsides, natural terrain landslide hazards may need to be studied and suitable mitigation measures should be provided where necessary as part of the developments |
| **Potentially Hazardous Installations and Consultation Zones** | • PHIs, including liquefied petroleum gas (LPG) storage facilities (in oil terminals, bulk stores & substitute natural gas plant, etc.), town gas installations, petrol or naphtha stores, explosive factories/depots, liquid oxygen storage at industrial gas facilities and chlorine stores at water treatment works, are essential facilities<br>• CZ is delineated for each PHI within which proposed development will be referred to Coordinating Committee on Land-use Planning and Control relating to Potentially Hazardous Installations (CCPHI) for consultation. Extent and size of a CZ is determined with regard to local variation in topography, the types of PHI and their storage capacities<br>• Development proposals in the CZ will be assessed against the risk guidelines to ensure that risks to the public are confined to within acceptable limits<br>• Minimise the potential risks associated with a PHI by controlling the siting of PHIs and the land use in their vicinity and by requiring the installation to be constructed and operated to specified standards<br>• Sizable developments in the CZ are normally not approved |

| Sensitive and Challenging Areas | Considerations |
|---|---|
| **Water Catchment, Reservoirs & Hydrographic Features** | • Provision of local source of fresh water<br>• Hydrographic features such as rivers and streams are part of the drainage system and some also perform ecological function |
| **Remote Islands** | • No road access and less frequent ferry services<br>• May have scope of unleashing the development potential of certain remote islands with the provision of road access or more frequent and fixed waterborne transport, though financial viability of ferry services would be an issue to be tackled |
| ***Security Considerations*** | |
| **Military Sites** | • All military sites of the Hong Kong Garrison are currently used for defence purposes<br>• The Government has no plan to seek any change to the use of these sites<br>• If the HKSAR Government needs for public use any part of the land used for military purposes by the Hong Kong Garrison, it shall seek approval of the Central People's Government (CPG), where approval is obtained, the HKSAR Government shall in return provide land and military facilities for the HK Garrison at such sites as agreed by the CPG, and shall bear all the expenses and costs entailed |
| **Closed Area**[7] | • Closed Area is needed as an integral part of security measures<br>• Maintain the integrity of boundary between Hong Kong and Mainland and combat illegal immigration and other cross-boundary criminal activities |

[7] The coverage of the Frontier Closed Area (FCA) is specified in the Schedule to the

2.6 The above are just the major development considerations that can be identified spatially and readily. In determining the suitability of an area for development, other planning and development considerations such as the traffic and infrastructure capacity in the area; feasibility and cost effectiveness of providing new or upgrading existing infrastructure to this area; compatibility with the existing developments; the potential environmental impact such as noise, air quality, visual and air ventilation impacts on the proposed development or on the surrounding areas, etc. should also be taken into account.

2.7 As regards whether the existing sites held under Private Recreational Leases (PRLs) should be released for other uses, the Home Affairs Bureau has set up an inter-departmental working group to conduct the review that covers this and other issues relating to the PRL policy. The Government will take into account the review findings in formulating the way forward for these PRL sites.

Frontier Closed Area Order made under section 36 of the Public Order Ordinance (Cap. 245). The Government announced in January 2008 the plan to reduce the land coverage of the FCA from about 2,800 ha to about 400 ha. The FCA reduction was implemented in three stages. The third stage of FCA reduction took effect on 4 January 2016.

# 3 A Multi-Pronged Approach for Creating Development Capacity

**There is no single measure that could address the land shortage problem and provide sufficient land to meet all the development needs. There is a clear need of a multi-pronged, robust and flexible approach to create the development capacity smartly.**

3.1 Five broad measures for sustaining our development capacity could be considered to address existing outstanding demand for developable land and to meet various projected social and economic needs:

## Optimising

3.2 For a small city like Hong Kong, intensifying or optimising the use of land is surely one of the measures for sustaining development. We should review the existing land uses and explore opportunities to enhance land use efficiency through :

(i) increasing the development intensity of land under planning studies or in areas outside the densely built-up areas as an expedient way to gain more developable floor area while taking into account infrastructure capacity and urban design considerations. As announced in the 2014 Policy Address and subsequently set out in the Hong Kong Planning Standards and Guidelines Chapter 2, except for the north of Hong Kong Island and Kowloon Peninsula which are more densely populated, it is feasible to generally increase the maximum domestic plot ratio currently permitted for the other Main Urban Areas and New Towns by around 20% as appropriate and where planning terms permit;

(ii) upzoning/ rezoning sites suitable for development with land use reviews of existing land (e.g. government sites) or converting reserved sites with no development plan or that are no longer used for their original purposes to other uses. Reviews on the government land currently vacant, under Short Term Tenancies or different short-term, "Government, Institution or Community" and other government uses, as well as "Green Belt" sites have identified some 150 potential housing sites, most of which will be made available in the five years of 2014/15 to 2018/19 for housing development, with an estimated production of over 210 000 flats (over 70% are public housing);

(iii) adopting vertical city development by relocating existing land inefficient uses which are largely accommodated in the open air and occupying sizeable land, such as vehicle repair workshops, recycling yards and other brownfield operations, into multi-storey buildings or other land-efficient means subject to technical, operational and financial viability. In this regard, the Government will take the Hung Shui Kiu New Development Area (HSK NDA) as a pilot area for examining the feasibility of accommodating brownfield operations that are still needed in Hong Kong in a more land efficient manner. Feasibility studies on technical and building design, operation model and business viability of the proposed multi-storey buildings for brownfield operations have commenced; and

(iv) taking forward planning and engineering studies for development of new development areas and new town extension through comprehensive planning and infrastructure upgrading to achieve economies of scale in provision of transport and other infrastructural facilities, agglomeration economies and synergy of different land uses. Tung Chung New Town Extension (TCNTE), Kwu Tung North (KTN), Fanling North (FLN) and HSK NDAs, and Yuen Long South development are relevant examples.

**New Development Areas**

***Hung Shui Kiu New Development Area***

***Fanling North New Development Area***

***New Development Areas and New Town Extension***

*The KTN and FLN NDAs, as extensions to the Fanling/ Sheung Shui New Town, will provide about 60 000 new flats, with 60% for public housing, and 37 700 new job opportunities. The Fanling/Sheung Shui/Kwu Tung New Town will have a total population of about 460 000 upon full development.*

*As a regional economic and civic hub for the North West New Territories, the HSK NDA will be the next generation new town of Hong Kong complementing the new towns of Tin Shui Wai, Yuen Long and Tuen Mun for provision of housing, employment opportunities and civic facilities. With a total population of about 218 000, the HSK NDA will provide about 61 000 new flats and 150 000 new job opportunities.*

*Leveraging on the future economic opportunities brought by the anticipated completion of various transport infrastructural projects in Lantau, the TCNTE will provide about 49 400 new flats and about 40 000 new job opportunities. The total population of Tung Chung New Town will be expanded to about 270 000 with its extension.*

# Swopping

3.3 To better utilise our precious land resources, opportunities should be explored to free up prime and/ or highly accessible sites for more beneficial uses by swopping land uses :

(i) to relocate land uses not requiring prime location or relatively footloose, such as some Government offices and facilities, away from the urban centre to free up urban land for residential and economic uses. For those facilities that are tied to the local population or have a particular role to play in terms of urban design, air ventilation, etc., due regard should be given to these aspects in the review process;

(ii) to better utilise the land that are not suitable for high density development, such as restored landfills, to accommodate community and recreational uses, e.g. parks, gardens, children's playground, jogging and fitness circuits, etc., thereby freeing up existing sites for higher density development; and

(iii) to identify natural environment of high environmental and ecological value for conservation and enhancement while releasing land of low conservation value and public enjoyment value for other beneficial uses, such as areas at the fringe of built-up areas.

### *Restored Landfills*

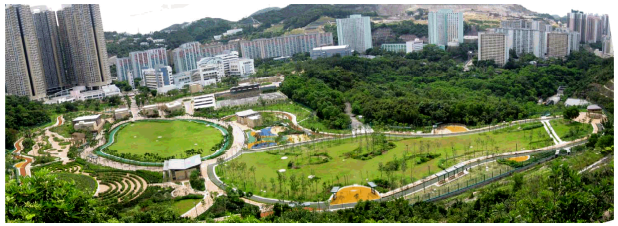
*There are at present 13 closed and three existing landfills in Hong Kong. After minimizing the potential adverse impacts on the environment and rendering them safe by restoration, the restored landfills could be turned into beneficial after-uses.*

*The restored landfills can be landscaped to provide green zones or developed into different public recreational uses such as sports facilities, multi-purpose grass pitches and recreational parks. For example, part of the Former Shuen Wan Landfill in Tai Po was converted into golf driving range in 1999, part of the Former Gin Drinkers Bay Landfill was developed into the HK Jockey Club International BMX Park in 2009, the Former Jordan Valley Landfill was turned into Jordan Valley Park in 2010, and waterfront of the former Tseung Kwan O Stage I Landfill was developed into a cycle track cum footpath in 2012. To make better use of restored landfills which after-uses are not yet in place, the Restored Landfill Revitalisation Funding Scheme was announced in the 2014 Policy Address to encourage non-profit-making organisations and national sports associations to develop recreational, environmental or other community facilities on these sites.*

***Golf Driving Range (Former Shuen Wan Landfill)***

***HK Jockey Club International BMX Park (Former Gin Drinkers Bay Landfill)***

***Jordan Valley Park (Former Jordan Valley Landfill)***



***Cycle Track cum Footpath (Waterfront of the former Tseung Kwan O Stage I Landfill)***

# Creating

3.4 Apart from utilising our existing land efficiently, we should step up efforts to create new land and identify new land supply sources to meet our social and economic development needs, provide the necessary space for improving our built environment and liveability, and build up a reasonable development capacity to cater for uncertainties and future changes. Means of creating new land include the following :

(i) reclamation is an efficient and cost-effective way to create development capacity as no existing settlements, and hence no land resumption, clearance and rehousing are involved. Social impact is relatively insignificant as there will be no displacement of existing communities. However, we should carefully select suitable locations outside the Victoria Harbour and of appropriate scale so as to avoid unacceptable impacts on the environment and marine ecology. We have to continue preserving our eastern waters which are of high ecological value and, for western waters, avoid the environmental sensitive areas including the existing and proposed protected marine areas. In earlier completed “Enhancing Land Supply Strategy” study, five potential near-shore reclamation sites, namely Lung Kwu Tan, Siu Ho Wan, Sunny Bay, Ma Liu Shui and Tsing Yi Southwest, and the potential for constructing artificial island in central waters between Hong Kong Island and Lantau have been identified for further study;

(ii) unsightly brownfield sites occupy a large tract of rural land. Brownfield operations such as container yards, container vehicle parking, container vehicle repairing, industrial workshops, cargo handling/ consolidation, open storage, recycling yards, construction machinery and materials storage, etc. are often incompatible with the surrounding rural uses and generate adverse environmental, traffic and drainage impacts. There are opportunities to turn some of these clusters into a new source of land supply through comprehensive and integrated planning with corresponding provision of community facilities and infrastructure upgrading. Indeed, the Kwu Tung North, Fanling North and Hung Shui Kiu NDAs and the Yuen Long South development, all at various stages of planning, involve a total of about 340 ha of brownfield sites. The Government has also carried out the "Preliminary Feasibility Study on Developing the New Territories North" to look into the development potential of New Territories North which covers a large number of brownfield sites. With a view to facilitating the formulation of appropriate policies and measures for tackling the brownfield issue, the Planning Department will commence a consultancy study on the existing profile and operations of brownfield sites in the New Territories in early 2017. The study findings are crucial input for planning for consolidation, relocation, phasing out or retention of brownfield sites having regard to their source of demand from the respective economic sectors or industries. They will also enable the Government to explore holistically how the necessary economic activities on brownfield sites could be accommodated in an optimal manner,

while addressing the land use incompatibility and environmental and traffic issues caused by brownfield operations. They will also provide a basis for assessing the development constraints and potential of areas with presence of brownfield sites, and support our ongoing efforts to release these sites for development through comprehensive planning. As land resumption and clearance, compensation and relocation arrangements may be involved, the development of brownfield sites would be a source of medium to long-term land supply; and

***Brownfield Sites in Hung Shui Kiu***

***Brownfield Sites in Yuen Long South***

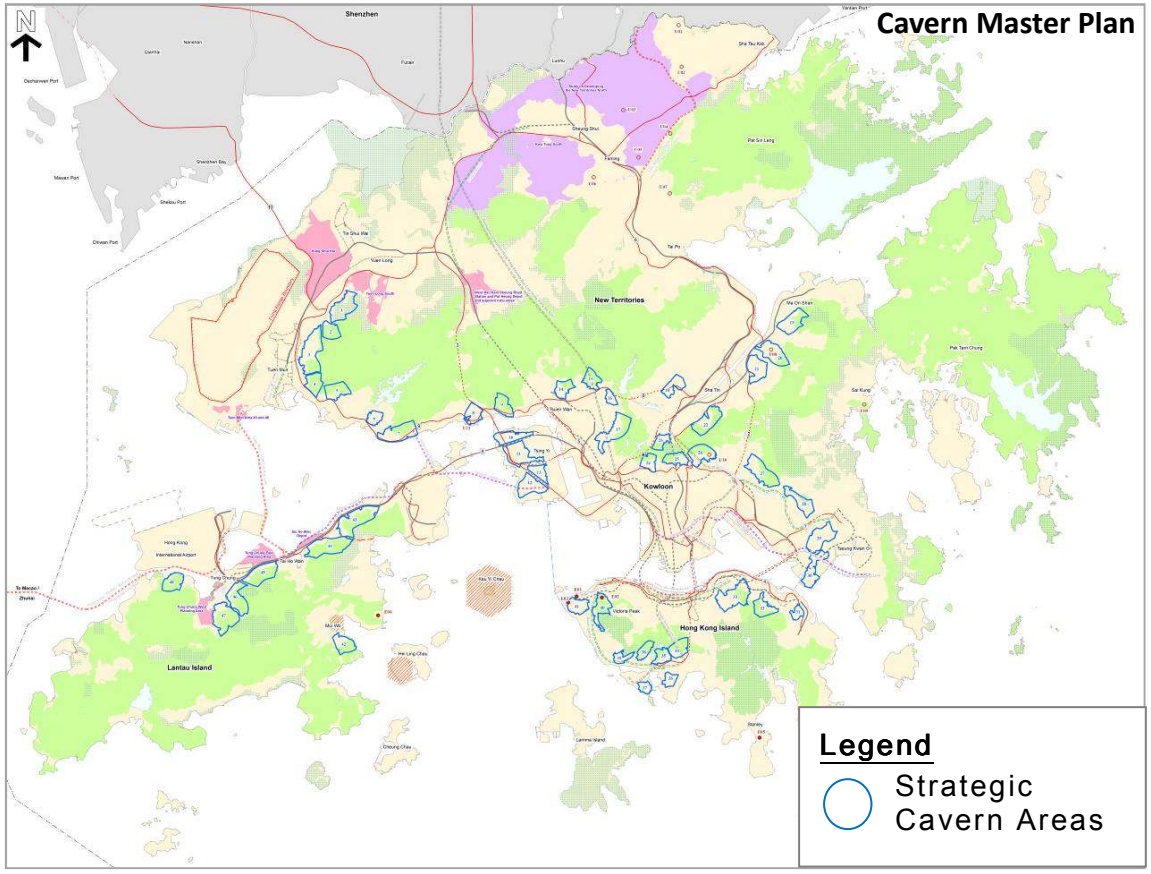
(iii) to carefully select greenfield sites (including green belts) for development giving due regard to conservation value, public enjoyment value, geotechnical and infrastructural constraints, etc.

# Innovating

3.5 Harnessing technological advancement, there are opportunities to innovate the method of land production and overcoming technical constraints to unlock development potential:

(i) to explore more rock cavern development so as to release the valuable surface sites for other beneficial uses through placing suitable new facilities or relocating existing government facilities in caverns. Cavern development, under the Government's multi-pronged approach in enhancing land supply, could serve as a sustainable and innovative means for expanding land resources in the long term. To enhance the use of rock cavern development, a study on the "Long-term Strategy for Cavern Development – Feasibility Study" has been conducted with the aim of preparing a territory-wide Cavern Master Plan (CMP), formulating guidelines to facilitate future cavern developments, and drawing up preliminary plans for relocating suitable public facilities to cavern so as to release urban sites for development. The CMP, delineating 48 Strategic Cavern Areas (SCVAs), has been prepared under the study. It is non-statutory and serves as a planning tool providing a broad strategic planning framework to guide and facilitate territory-wide cavern development in Hong Kong. The SCVAs offer an additional source of solution space to accommodate suitable land uses in cavern to sustain the population and economic growth of Hong Kong. A list of existing government facilities

including archives, testing laboratories, vehicle pounds, warehouses, service reservoirs, refuse transfer stations and sewage/water treatment works have been selected for broad planning and technical assessments to evaluate the planning and technical feasibility, and financial viability of relocating these facilities into caverns. A suitable mechanism will be implemented to optimise the use of SCVAs by managing cavern and other subsurface developments in SCVAs, without compromising beneficial surface land use and developments. The endorsed CMP will be available on the websites of the Civil Engineering and Development Department and Planning Department. Together with an updated list of potential land uses for cavern development, the endorsed CMP will also be incorporated into the relevant chapter of the Hong Kong Planning Standards and Guidelines;




***Relocation of Government Facilities to Caverns***

*The relocation of the Sha Tin Sewage Treatment Works (STW) to rock cavern would release about 28 ha of land at the existing Sha Tin STW site for housing and other uses.*

*With a view to releasing a total of about 6 ha of land for other beneficial uses, the feasibility studies on the relocation of the Sai Kung STW, the Sham Tseng STW and the Diamond Hill Fresh Water and Salt Water Service Reservoirs to caverns have commenced.*

## Examples of Cavern Development in Hong Kong

***Stanley Sewage Treatment Works***

***Island West Transfer Station***

***Kau Shat Wan Government Explosive Depot***

## Relocation of Western Salt Water Service Reservoirs to Cavern to Release Surface Land for Construction of HKU Centennial Campus

(ii) to expedite more underground space developments to help improve the urban environment, especially in densely-populated and congested areas while creating usable space for commercial and community uses, relocating incompatible facilities and thereby freeing up surface land for other beneficial uses, and enhancing urban connectivity and/or unlocking development potential through the provision of pedestrian-cum-retail links and connections with existing developments, subways, transport facilities, etc. The Government is continuing with a territory-wide study to explore opportunities and constraints of implementing underground space development in the urban areas and new towns of Hong Kong. The findings of the study will provide a basis for future planning and development of underground space in the territory. A more detailed study on underground space development in four strategic urban areas, namely Tsim Sha Tsui West, Admiralty/ Wan Chai, Causeway Bay and Happy Valley with the objectives of formulating underground master plans and identifying suitable priority projects has also commenced;

**The Four Strategic Urban Areas under the Underground Space Development Pilot Study**



***Stage 1 Public Engagement Digest of the Pilot Study on Underground Space Development in Selected Strategic Urban Areas***

**Overseas Examples of Underground and Cavern Development**

***Itäkeskus Swimming Hall, Finland***

***Notional Archives, Norway***

***Gjøvik Olympic Mountain Hall, Norway***

***Underground City, Montreal***

***Beurstraverse Mall, Rotterdam***

(iii) to unleash development potential of sites subject to technical and infrastructural constraints, innovative and technological means could be explored, such as declassifying some PHIs with reduction in risk (e.g. by innovative tackling of chlorine storage/ use in water treatment works), overcoming geotechnical constraints (e.g. by innovative slope engineering works), and providing multi-layered utility blocks, government facilities, mechanical vehicle/cycle parking, etc.; and

(iv) to explore more topside development to optimise use of land. As in the case of the Hong Kong Boundary Crossing Facilities (HKBCF) Island of Hong Kong-Zhuhai-Macao Bridge (HZMB), a planning, engineering and architectural study is being carried out to explore the optimum utilisation of land at the HKBCF Island for topside and underground development for commercial and other economic uses to capitalise on the locational advantage of the HKBCF Island.

***Stage 1 Community Engagement Digest of the Planning, Engineering and Architectural Study for Topside Development at HKBCF Island of HZMB***

# Life-cycle Planning

3.6 There are a number of existing and ex-quarry sites in Hong Kong. After completion of rock excavation, the quarry sites would usually be rehabilitated to green area to blend in with the surrounding environment. Subject to further study/ investigation, the ex-quarry sites may be suitable for beneficial after-use. Similarly, closed landfills in Hong Kong could be turned into beneficial after-uses after minimizing their potential adverse impacts on the environment and rendering them safe by restoration. As ex-quarry sites and restored landfill sites usually have the merits of not involving areas of ecological significance, the beneficial after-use stands a higher chance of gaining public acceptance, as in the case of the ex-Anderson Road Quarry development.

3.7 To maximise the development opportunities and expedite the release of disused quarries and landfill sites or other uses of a "temporary" nature for beneficial after-uses, life-cycle planning should be undertaken in early stage to explore maximising the production of developable land and possibility of phased release of developable sites. To facilitate early and better utilisation of the sites in future, early planning should bear promoting beneficial after uses in mind.

***Ex-Anderson Road Quarry Development***

*The Anderson Road Quarry has a total area of about 86 ha, in which a platform of about 40 ha will be formed for development upon the completion of the rehabilitation works. According to the recommendations made under the "Planning Study on Future Land Use at Anderson Road Quarry – Feasibility Study", the site will provide about 12 ha of land to accommodate a planned population of 25 000 and provide about 9 410 flats, with a private-to-subsidized housing ratio of 80:20. Land will also be provided for commercial uses, government, institution or community facilities, a quarry park, open spaces and amenity areas.*

# 4 Considerations for Prioritising Land Supply Sources

4.1 For meeting Hong Kong's long-term social and economic needs, fulfilling community aspirations for better quality of living and better responding to unforeseeable circumstances, a multi-pronged, robust and flexible approach to create development capacity through optimising the use of developable land and identifying new developable land is proposed. While the above five planning measures for sustaining our development capacity would need to be pursued vigorously, it is prudent to prioritise land supply sources according to the principle of sustainability.

4.2 In identifying new developable land, sites with high ecological, landscape and/ or heritage value should be protected and conserved at the outset. The development potential of sites adjoining existing built-up areas and infrastructure which are deserted or having low conservation value and public enjoyment value could be reviewed in a systematic manner. We propose to accord priority to sites at the fringe of built-up areas or degraded land (e.g. brownfield sites) and reclaiming land of reasonable scale in waters with low ecological impact for development.

4.3 Under the Hong Kong 2030+, a ballpark estimate of long-term land requirements and supply analysis has been conducted[8]. As a ballpark estimate based on the best available information, the total new land requirement from now into the long term (beyond 2040) would be a minimum of about 4 800ha. Discounting a supply of about 3 600 ha from the committed and planned projects (which are expected to be fully materialized around the mid-2030s), the outstanding requirement would be more than 1 200 ha. This scale equates to about four times of the developable land area of Kai Tak Development.

4.4 Considering such a scale of additional land required for housing, economic, government, institution or community, open space and supporting infrastructure purposes, there is a strong case for identifying sizeable strategic growth areas to allow for holistic planning with a good mix of uses, as opposed to infill or smaller scale developments which will be difficult to provide sustainable land supply.

4.5 Providing additional land for meeting various social and economic needs through comprehensive development of new town with the provision of a full-range of supporting infrastructural and community facilities is not new for Hong Kong. Since the 1970s, the Government has been developing nine new towns[9]. Recent development of new

[8] Please refer to another Topical Paper 'Consolidated Land Requirement and Supply Analysis' under Hong Kong 2030+ for more details.

[9] Namely Tsuen Wan/Kwai Tsing, Sha Tin/Ma On Shan, Tuen Mun, Fanling/Sheung Shui, Yuen Long, Tai Po, Tin Shui Wai, Tseung Kwan O and Tung Chung.

development areas and new town extension including TCNTE, KTN and FLN NDAs, HSK NDA and Yuen Long South development also adopt this comprehensive planning and infrastructure upgrading approach to achieve economies of scale in the provision of transport and other infrastructural facilities, agglomeration economies and synergy of different land uses. Hence, new Strategic Growth Areas would need to be identified and planned in a timely manner to meet the estimated long-term outstanding land requirement.

4.6 Sizeable Strategic Growth Areas would render economies of scale in the provision of land, transport and infrastructure, agglomeration economies and synergy of different land uses possible. Indeed, without overall planning and supporting infrastructural facilities, it would be difficult to support high-density developments at individual sites in a piecemeal manner. By conducting comprehensive planning and engineering studies for sizeable strategic growth areas, the overall development needs and constraints of the areas could be examined more thoroughly, traffic and environmental impacts caused by the proposed developments could be addressed more properly, and adequate provision of infrastructural and community facilities could be ensured. Comprehensive planning of sizeable strategic growth areas could also provide greater opportunities and flexibility for incorporating smart and low-carbon initiatives, as well as good urban design practice.

4.7 Future growth areas should be strategically located having regard to factors such as achieving a more balanced population and employment distribution, optimising the use of existing and planned/ possible transport and infrastructural facilities, environmental sustainability, infrastructural capacity, impact on existing communities, and cost effectiveness, etc. Having examined the various constraints in land development as set out in the earlier part of this paper and considering the above factors, two Strategic Growth Areas are identified.

4.8 Through provision of sizeable development land for housing, economic uses, supporting community facilities and strategic transport infrastructure linking the main urban areas of Hong Kong, the two proposed Strategic Growth Areas proposed under the Hong Kong 2030+ (i.e. East Lantau Metropolis (ELM) and New Territories North (NTN)) would help accomplish a balanced community development, achieve synergy with existing developments, better optimise the use of existing and planned/ possible transport and infrastructural facilities, and enhance the spatial distribution of population and employment in the territory. Creation of employment nodes in these Strategic Growth Areas will bring jobs closer to homes so as to reduce cross-district trips, helping relieve traffic congestion in key commuting transport corridors during peak periods.

4.9 ELM, which will be situated on artificial islands by reclamation in the waters with lower ecological value mid-way between Hong Kong Island and Lantau, aims to create a smart, liveable and low carbon new metropolis accommodating a planned population ranging from 400 000 to 700 000 and a third Central Business District (CBD3) for promoting economic development and providing job opportunities.

4.10 Through comprehensive planning and more efficient use of the brownfield sites and abandoned agricultural land in the New Territories, the development of the NTN would be a significant source of land supply for building up new

communities with a planned population of about 255 000 or 350 000 and developing modern industries and industries preferring a boundary location while improving the living environment of the existing area by better utilising the brownfield sites.

4.11 More elaborations on the guiding principles, the Strategic Growth Areas and the overall conceptual spatial framework for Hong Kong 2030+ are set out in another Topical Paper entitled "Conceptual Spatial Framework".

4.12 The key strategic directions and key actions proposed for creating development capacity are listed in Table 2.

**Table 2 Key Strategic Directions and Actions for Creating Development Capacity**

| Key Strategic Directions | Key Actions |
|---|---|
| ***Optimising land uses*** | • to upzone/rezone suitable sites<br>• to relocate uses requiring less prime sites<br>• to relocate inefficient low-density uses to multi-storey buildings<br>• to increase development intensity where planning terms permit<br>• to explore more topside development to optimise use of land<br>• to explore innovative means to remove infrastructural/ technical/ geotechnical constraints for unleashing development potential of sites |
| ***Identifying new land*** | • to conserve and enhance natural environment of high environmental and ecological value and to identify sites with low conservation value and public enjoyment value for other productive uses<br>• to review brownfield sites and deserted agricultural land in the New Territories<br>• to explore reclamations at an appropriate scale outside of Victoria Harbour<br>• to explore more rock cavern, underground space and topside developments<br>• to plan early for beneficial after-use of quarries, landfill sites or other uses of a temporary nature |

# CONCLUSION

Sustaining the social and economic development of Hong Kong and providing us with the manoeuvring spaces for improving our quality of living such as larger living space, more public amenities and more community facilities as well as coping with unforseeable circumstances including changes in various projection assumptions require the supply of developable land and space, which has been lagging behind in recent years. For sustaining our development capacity, a multi-pronged, robust and flexible approach should be adopted. However, in optimising use of land, land with high ecological, landscape and/ or heritage value needs to be preserved and enhanced. Priority should be accorded to degraded areas (including brownfield sites) and those areas at the fringe of built-up areas which are deserted/ having low conservation value for development. There is also a strong case for sizeable strategic growth areas for holistic planning with a good mix of uses, and economies of scale in land and infrastructure development.