

## **TASK FORCE ON LAND SUPPLY**

### **Reclamation Outside Victoria Harbour**

#### **PURPOSE**

This paper provides Members with an overview of the Government's work on taking forward Reclamation outside Victoria Harbour, including the opportunities and challenges ahead in relation to this land supply option.

#### **BACKGROUND**

2. The reclamation of land from the sea has long been used in mountainous Hong Kong to expand the limited supply of developable land. As at 2016, about 70km<sup>2</sup><sup>1</sup> of land representing about 6% of the total land area (or 25% by developed area<sup>2</sup>) of Hong Kong was formed by reclamation. Such reclaimed land is accommodating about 27% of our total population and 70% of the commercial activities, including our Core Business District (CBD). In particular, for new town developments, reclamation has played a pivotal role as six of the nine existing new towns, namely Tsuen Wan, Shatin, Tuen Mun, Tai Po, Tseung Kwan O and Tung Chung, were built on reclaimed lands (**Figure 1**). Besides housing and commercial uses, reclamation is a major source of land for transport infrastructures and urban expansion like the Hong Kong International Airport and West Kowloon Cultural District.

3. Between 1985 and 2000, the Government created over 3 000 ha of land through reclamation, i.e. an average of about 200 ha (2 km<sup>2</sup>) per annum. The strong public aspiration of protecting and preserving Victoria Harbour as a special asset and a natural heritage of Hong Kong people is enshrined in the Protection of the Harbour Ordinance (PHO)

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<sup>1</sup> 1 km<sup>2</sup> = 100 ha

<sup>2</sup> Total land area of Hong Kong: 1 106.34 km<sup>2</sup>; Land developed : 25% (~ 276.59 km<sup>2</sup>); Country parks and nature reserves: 40% (~ 442.54 km<sup>2</sup>)

which was enacted in 1997. To strike a balance among economic development, environmental protection and natural heritage conservation, the Government has been very cautious in pursuing further reclamation in recent years. The PHO stipulates that “the harbour is to be protected and preserved as a special public asset and a natural heritage of Hong Kong people, and for that purpose there shall be a presumption against reclamation in the harbour.” According to the ruling made by the Court of Final Appeal regarding the PHO in 2004, there must be a compelling and overriding public need to displace the duty of protection and preservation in order to rebut the presumption against reclamation within Victoria Harbour. In essence, major reclamation works for land development within Victoria Harbour become not practical. Even at the waters outside Victoria Harbour, reclamation for residential and commercial developments has virtually stopped. Over the 15-year period between 2000 and 2015, only about 690 ha of land, or an average of some 40 ha per annum, mainly in relation to infrastructure projects, were reclaimed causing the lagging behind of the land supply for housing and other uses in recent years. Details on the past figures on land formation and reclamation are given in **Figure 2**. On the contrary, our neighbours, Singapore and Macao, have been actively reclaiming land from surrounding waters to expand their territories; and as a result, the land area of Singapore has been increased by 24% (or 138 km<sup>2</sup>) while that of Macao is about 160% (or 19 km<sup>2</sup>).

4. Reclamation can generate a large piece of new land with great flexibility for comprehensive planning of a new community, in particular for creating smart, green and resilient development. In developed areas, the new reclaimed land nearby can provide space for extension of a new town, e.g. Tung Chung New Town Extension. For relatively remote locations, the new land can be used as decanting sites for accommodating facilities affected by other land supply options and allowing or relocating special industrial or “Not-in-My-Backyard” facilities away from the urban areas. Unlike other land supply options, reclamation does not result in major impacts on existing land uses and generally does not require private land resumptions, and household resettlements. In addition, reclamation is considered as the most suitable and practical means for building land reserve to meet the ever-changing needs of the society<sup>3</sup>, as well as an ideal outlet to handle

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<sup>3</sup> In March 1999, the Hong Kong government announced the intention to develop a “cyberport”, which would help local businesses capitalizing on the rapid growth of the Internet. The Cyberport project was developed at the Telegraph Bay in the Southern District of Hong Kong Island, on a 24 ha of land reclaimed in 1989.

locally generated public fill<sup>4</sup>.

5. Due to the virtual stoppage of local reclamation projects after early 2000s, Hong Kong has been largely relying on the delivery arrangement agreed with the State Oceanic Administration of the Mainland in delivering the local surplus public fill to receptor sites at Taishan. From 2007 to 2016, a total of about 100 million tonne public fill were delivered to Taishan for reclamation creating about 660 ha of land (almost twice the size of the Kai Tak Development). If reclamation had continued in Hong Kong with the use of these surplus public fill over the past decade, the land shortage problem that we are facing could have been significantly alleviated.

6. The impacts on coastal habitats, marine ecology and fisheries resources, as well as port operation, marine and land traffic and local communities are the main concerns of reclamation. Some members of the public have expressed particular concerns on the impacts to Chinese Water Dolphin and coral habitats. Others are apparently worried about impacts to the existing residential or even commercial developments originally fronting the sea. Arising from such concerns, the impacts on the environment and/or local communities have been taken as the major site selection criteria when contemplating any major reclamation project. In addition, the Government has committed to adopt the state-of-the-art environmental friendly construction methods such as non-dredged seawall design and incorporation of eco-shoreline in the reclamation projects, except in circumstances which are impractical.

## **ENHANCING LAND SUPPLY STRATEGY STUDY**

7. With a view to exploring new sources for land supply, the Government conducted the study on “Enhancing Land Supply Strategy – Reclamation outside Victoria Harbour and Rock Cavern Development” (ELSS) between 2011 and 2014, which included a territory-wide search to identify potential reclamation sites, and two-stage public engagement (PE) exercise<sup>5</sup>.

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<sup>4</sup> Public fill is generally the inert portion of the construction and demolition material. It mainly includes construction debris, rubble, earth, bitumen and concrete, which are suitable for use in land reclamation and site formation.

<sup>5</sup> The corresponding Executive Summary of the Final Reports and the Executive Summary of the reports on Stage 1 and Stage 2 PE have been uploaded to the Civil Engineering and Development Department’s (CEDD) website (<http://www.cedd.gov.hk/eng/landsupply/index.html>).

### ***Territory-wide Site Searching***

8. The results of the Stage 1 PE revealed that there was broad support for the six-pronged approach<sup>6</sup> in land supply which included reclamation. The public generally agreed on the Site Selection Criteria<sup>7</sup> (SCC) for reclamation, with the impacts on the environmental and local community regarded as the most important criteria. Other consensus included more land would be required to meet housing needs for improving the living environment and enabling infrastructural development; and support for establishment of land reserve.

9. Generally, the Central Waters are considered more suitable for large-scale reclamation development as they can avoid shorelines with high ecological values. The Eastern Waters are generally not suitable for reclamation because they are characterized by the abundance of mangroves with rich diversity and fauna species, seagrass areas and key coral areas. Since the Western Waters are already being constrained by several major infrastructure projects under planning or construction, creation of additional sizable artificial islands is not feasible, though there is some opportunity for near-shore reclamations. In view of the above and based on the SCC, a long list of reclamation sites was drawn up for broad technical assessments (including environmental assessment) to evaluate their development potential.

10. Based on the results of the broad technical assessments, several potential nearshore reclamation sites, including Lung Kwu Tan at Tuen Mun, Siu Ho Wan and Sunny Bay at North Lantau, Ma Liu Shui at Sha Tin, and Tsing Yi Southwest were selected for further consideration. Besides, the site assessment exercise has identified that there is great development potential for artificial islands in the Central Waters between Lantau and Hong Kong Island that worth further exploring. **Figure 3** gives the locations of these potential reclamation sites. These potential sites were made known during the Stage 2 PE and public views on individual sites were collected for further consideration.

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<sup>6</sup> Six-pronged approach includes resumption of rural land, redevelopment, land rezoning, reuse of ex-quarry sites, rock cavern development and reclamation.

<sup>7</sup> The SCC are: (1) social harmony & benefit (impact on local community, site location and accessibility, local needs); (2) enhanced environmental performance (environmental impacts, environmental benefits); (3) economic efficiency & practicality (cost effectiveness, planning flexibility, engineering feasibility).

11. Though being selected, these sites have their own merits and concerns, which need to be assessed and considered in more detail. For instance, the Siu Ho Wan and Lung Kwu Tan sites have less impact on the local community and possess the advantages of availability of existing transport links. However, they are associated with relatively higher environmental concerns, such as being in close proximity to Chinese White Dolphin (CWD) habitats.

### ***Progress Update of the Selected Potential Sites under ELSS***

12. Three of the five near-shore potential reclamation sites, viz. Lung Kwu Tan, Siu Ho Wan and Sunny Bay, are located in the Western Waters, where a number of major infrastructure projects are under planning or construction. To strategically assess their overall impacts on the environment, CEDD conducted a cumulative environmental impact assessment (CEIA) in respect of air quality, water quality, ecology and fisheries for these three sites taking into consideration the existing, committed, planned and proposed projects in their vicinity. The CEIA study did not identify any major or insurmountable issues with respect to the four environmental aspects. With due consideration of the potential impacts on the identified CWD habitat<sup>8</sup> at Siu Ho Wan, we have reduced the potential size of the proposed Siu Ho Wan reclamation. Members of Advisory Council on Environment (ACE) were briefed on 9 March 2015 of the assessment findings. In end-2016, the Government also established the Brothers Marine Park in the vicinity to protect the CWD habitat.

13. Taking into account the CEIA results, the Government has been pursuing various further studies for the identified potential reclamation sites. Recently, the Government completed technical studies on the reclamations at Ma Liu Shui, Lung Kwu Tan and Siu Ho Wan covering key strategic infrastructure, engineering, environmental and social issues of the projects. The results of the studies reveal that there are no insurmountable issues. The technical findings have also addressed views and concerns collected in the Stage 2 PE of the ELSS.

14. The five potential near-shore reclamation sites have also been featured in the on-going “Hong Kong 2030+: Towards a Planning

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<sup>8</sup> CEDD appointed experts on CWD to conduct field surveys including shore-based theodolite tracking and passive acoustic monitoring on CWD at Sunny Bay, Siu Ho Wan and Lung Kwu Tan from August 2013 to February 2014 to study the CWD usage and behaviour in the near-shore waters so as to provide site specific data to facilitate the ecological impact assessment of the CEIA study.

Vision and Strategy Transcending 2030” Study and the two at Sunny Bay and Siu Ho Wan also form part of the Sustainable Lantau Blueprint promulgated in June 2017. It is also suggested in the Study and the Blueprint that artificial islands in the Central Waters between Lantau and Hong Kong Island can be created for developing the East Lantau Metropolis (ELM) as one of the long-term strategic growth areas which are crucial for the future development of Hong Kong.

15. To press ahead, the Government will carry out a planning and engineering (P&E) study for the Lung Kwu Tan reclamation. Based on the completed technical study, the reclamation can provide a large piece of land for special industries and rationalising the activities on existing brownfield areas through consolidation and upgrading

16. On the other hand, the Government is also prepared to carry out a P&E study on Sunny Bay reclamation which has been identified as a leisure, entertainment and tourism hub in a number of previous studies.

17. For the Ma Liu Shui reclamation, the Government plans to proceed with a P&E study. Besides the reclamation, the study will take into account the planning of the adjoining site vacated after relocation of the Sha Tin Sewage Treatment Works to caverns, with a view to providing land for development of high technology and knowledge-based industries, housing and other uses.

18. The Government will carry out strategic studies on artificial islands in the Central Waters between Lantau and Hong Kong Island, including the development of ELM. There may also be opportunities for creating artificial islands in the southern part of the central waters (in particular the waters off South Cheung Chau) for supporting long-term development of Hong Kong.

19. For the Siu Ho Wan reclamation, despite its recent completion of the technical study, the implementation programme is being reviewed taking into consideration the potential interface and cumulative impacts with the adjacent developments. The programme of proposed Tsing Yi Southwest reclamation will also be pending the review of the long-term port development.

## DEVELOPMENT POTENTIAL

### *Committed and Proposed Projects*

20. Apart from the five potential near-shore reclamations and the artificial islands in the Central Waters projects under planning, the Tung Chung East reclamation under the Tung Chung New Town Extension project (TCNTE)<sup>9</sup> will commence construction soon. The development potential and development timeframe of these reclamation projects are shown in Table 1 below.

**Table 1(a) – Development Potential of Proposed Reclamations**

	<b>Reclamation (approximately) (ha)</b>	<b>Potential land use (subject to further study)</b>	<b>Tentative land formation time</b>
<b>Near-shore Reclamations</b>	Sunny Bay: 60 to 100	Leisure, entertainment, tourism	2026-2030
	Lung Kwu Tan: 220 to 250	Industrial and other uses	2026-2030
	Ma Liu Shui: 60	High technology and knowledge based industries, housing and other uses	2026-2030
	Siu Ho Wan: 60 to 80	Training and education facilities	Subject to review
	Tsing Yi Southwest: (subject to review)	Subject to review	Subject to review

<sup>9</sup> The existing engineering infrastructure at Tung Chung New Town (TCNT) was completed in April 2003. The current population of TCNT is about 80,000 while the planned population is about 124,000. The Government has been planning to further develop the TCNT into a comprehensively planned new town with a larger population capacity and adequate local and regional community facilities. Following a three-stage PE exercise completed in October 2014, a development proposal of TCNTE including the Recommended Outline Development Plan, the major development parameters and land uses are formulated.

	<b>Reclamation (approximately) (ha)</b>	<b>Potential land use (subject to further study)</b>	<b>Tentative land formation time</b>
<b>Artificial islands in Central Waters</b>	<u>ELM</u> : ~1 000  Southern part of Central Waters (including south of Cheung Chau):  Subject to study	<u>ELM</u> : New core business district including housing and commercial uses  Southern part of Central Waters (including south of Cheung Chau):  Subject to study	Beyond 2030

**Table 1(b) – Development Potential of Tung Chung East Reclamation**

	<b>Reclamation (approximately) (ha)</b>	<b>Estimated Flat Production / Economic Use GFA (about)</b>	<b>Estimated Population Intake/GFA Availability</b>
<b>Tung Chung East Reclamation</b>	121	Flat no.: 40 800 units  Commercial GFA: 877 000 m <sup>2</sup>	2023 – 2030

***Other Potential Reclamation Sites***

21. There are opinions advocating for more reclamations outside Victoria Harbour. Despite the above-mentioned potential reclamation sites being studied by the Government, some have suggested that large-scale reclamations should also be considered in Tseung Kwan O, Tuen Mun, waters off Cheung Chau South, Lamma Island and Po Toi Island, etc. In particular, Cheung Chau South reclamation is suggested as having the potential for relocating the existing Kwai Tsing Container Terminals.



22. Amongst these proposals, the proposed reclamation at the waters off Cheung Chau South will be studied in the upcoming strategic studies on artificial islands in the Central Waters.

23. The reclamation sites at the Tseung Kwan O, Tuen Mun and Po Toi sites were broadly assessed in the ELSS study<sup>10</sup>. Regarding the Tseung Kwan O sites, there is a general public expectation that no additional reclamation will take place in the area in view of the Government's decision to pursue the "no further reclamation" option under the "Feasibility Study for Further Development of Tseung Kwan O". Apart from affecting the Butterfly Beach and existing waterfront marine facilities, like berths and the Tuen Mun Ferry Pier, any large scale reclamation at Tuen Mun Area 40 (east of River Trade Terminal) should take into consideration the existence of bundles of strategic submarine power cables connecting to the airport. The Po Toi site is quite ecologically sensitive because it is one of the sites where the endemic amphibian species Romer's Tree Frog is found and the waters in its vicinity are also frequently used by Finless Porpoise.

24. The Government has not carried out any assessment for the suggested large-scale reclamation at the waters west of Lamma Island. However, the close proximity of the Lamma Power Station, impacts on Finless Porpoise habitat, Hung Shing Ye Beach and the beach at Sham Wan<sup>11</sup>, and the lack of transport and other supporting infrastructures are issues of consideration.

## **CHALLENGES**

25. Besides the challenges in dealing with various possible impacts on the environment, the local communities, etc. as mentioned in paragraph 6 above, reclamation projects usually require substantial capital investments. However, past experience shows that near-shore reclamation is a relatively cost-effective land supply option, in particular those sites which are close to the existing transport network and can enjoy the benefits of shared use of existing supporting infrastructures (such as water supply and sewerage facilities) already in place in the nearby developed areas.

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<sup>10</sup> Though the reclamation extent and potential uses under ELSS might not be the same as those proposed by the public.

<sup>11</sup> The location is a Restricted Area designated to protect the nesting site of Green Turtles.

26. Regarding artificial islands, since they are created in the middle of the waters lacking transport or infrastructures facilities, relatively heavier investments will be required which will also be paid upfront in view of the substantial infrastructure provision. However, when examining the cost-benefits of this type of mega-scale reclamation projects, we should not only focus on the construction costs, but also the potential socio-economic benefits that will be brought to the whole community. Taking the ELM as an example, the artificial islands can provide sizeable flat land at a strategic location between Lantau and Hong Kong Island for the development of a new town and a CBD to improve the spatial distribution of homes and jobs in Hong Kong. The construction of new connecting transport infrastructures there offers an opportunity to enhance the transport connectivity between the urban areas, Lantau and the western New Territories, and provide an alternative transport link to the Hong Kong International Airport. It will also strengthen the transport connection from the traditional CBD to the Pearl River Delta east and west, bringing about significant social and economic benefits to the whole society. The development of ELM together with the other near-shore reclamations along the northern shore of Lantau Island are therefore of strategic importance to the future development of Hong Kong as set out in the Sustainable Lantau Blueprint.

27. Reclamation projects do take a long lead time from its initial planning to realization. **Figure 4** shows a typical implementation programme of a reclamation project. To reclaim a piece of sizable land, we need to carry out the necessary feasibility studies, and planning and engineering studies which involve several rounds of PE exercises. Coupled with other statutory and necessary procedures, detailed design and construction, the entire land development process would normally take a decade or more to complete.

## **VIEWS FROM STAKEHOLDERS/COMMUNITY**

28. Apart from the impacts on marine ecology, ecological conservation, transportation, cost-effectiveness, the site-specific public concerns on the five near-shore potential reclamation sites and possible artificial islands in the Central Waters are mostly related to potential impacts on local community, noise and air pollution, deterioration of water quality, marine and land traffic and huge construction cost.

## **ADVICE SOUGHT**

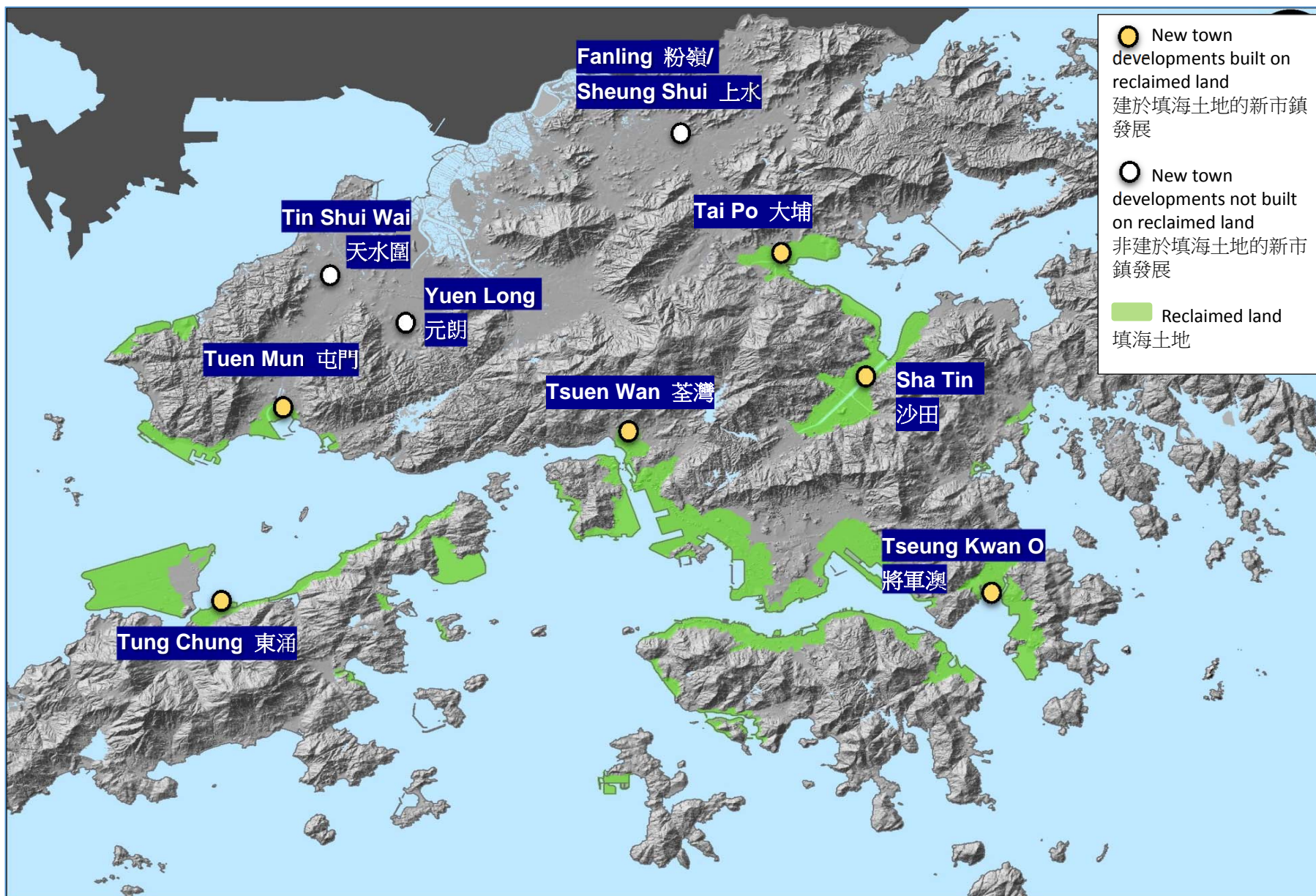
29. Members are invited to offer views on possible enhancements/refinements on the Government's land supply initiative on reclamation outside Victoria Harbour.

**Development Bureau  
Civil Engineering and Development Department  
2 November 2017**

# New Town Developments in Hong Kong

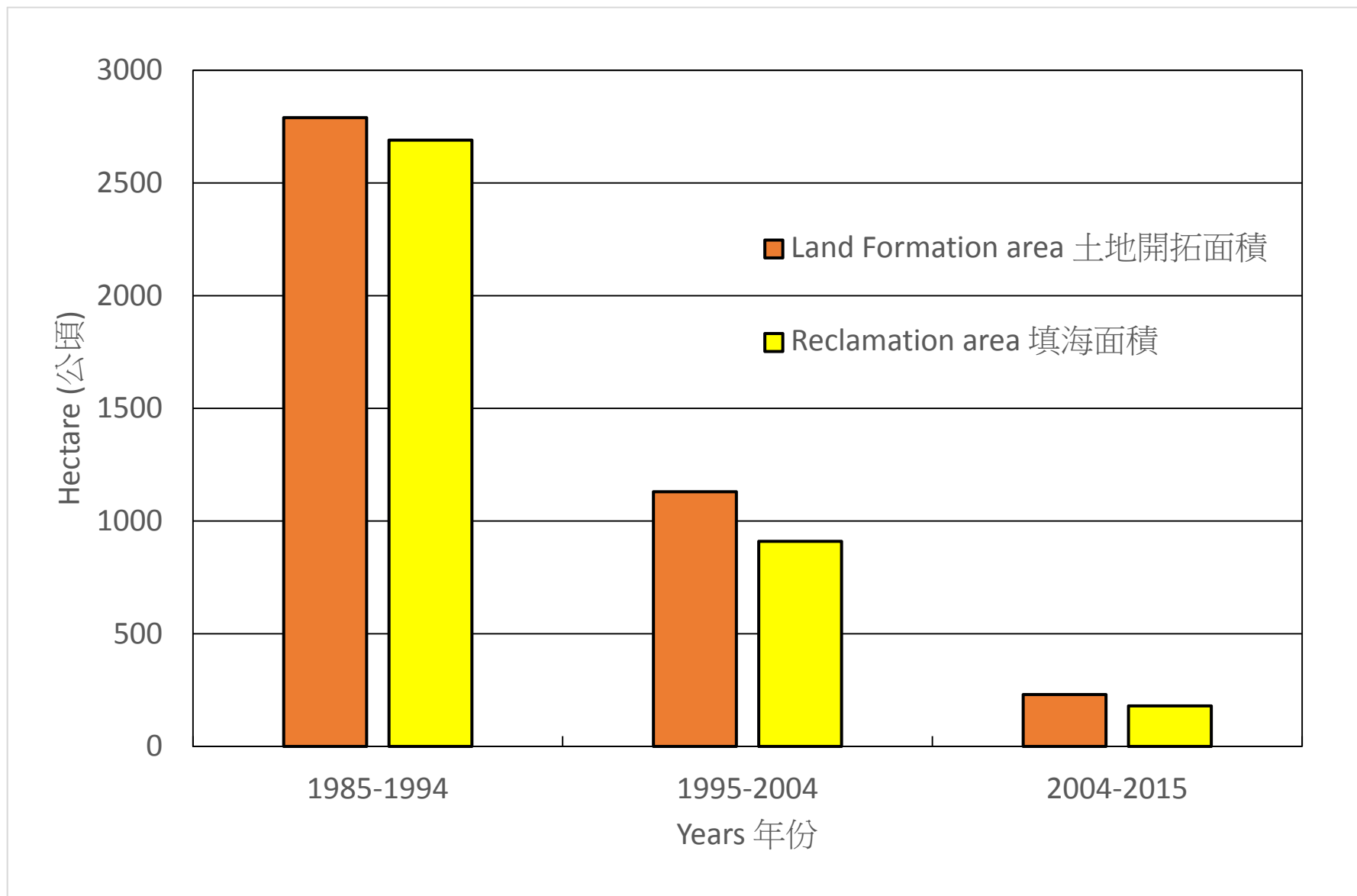
## 香港的新市鎮發展

Figure 1  
圖一



**Land Formation Area and Reclamation Area (1985-2015) (ha)**  
從 1985 至 2015 年間的土地開拓面積及填海面積 (公頃)

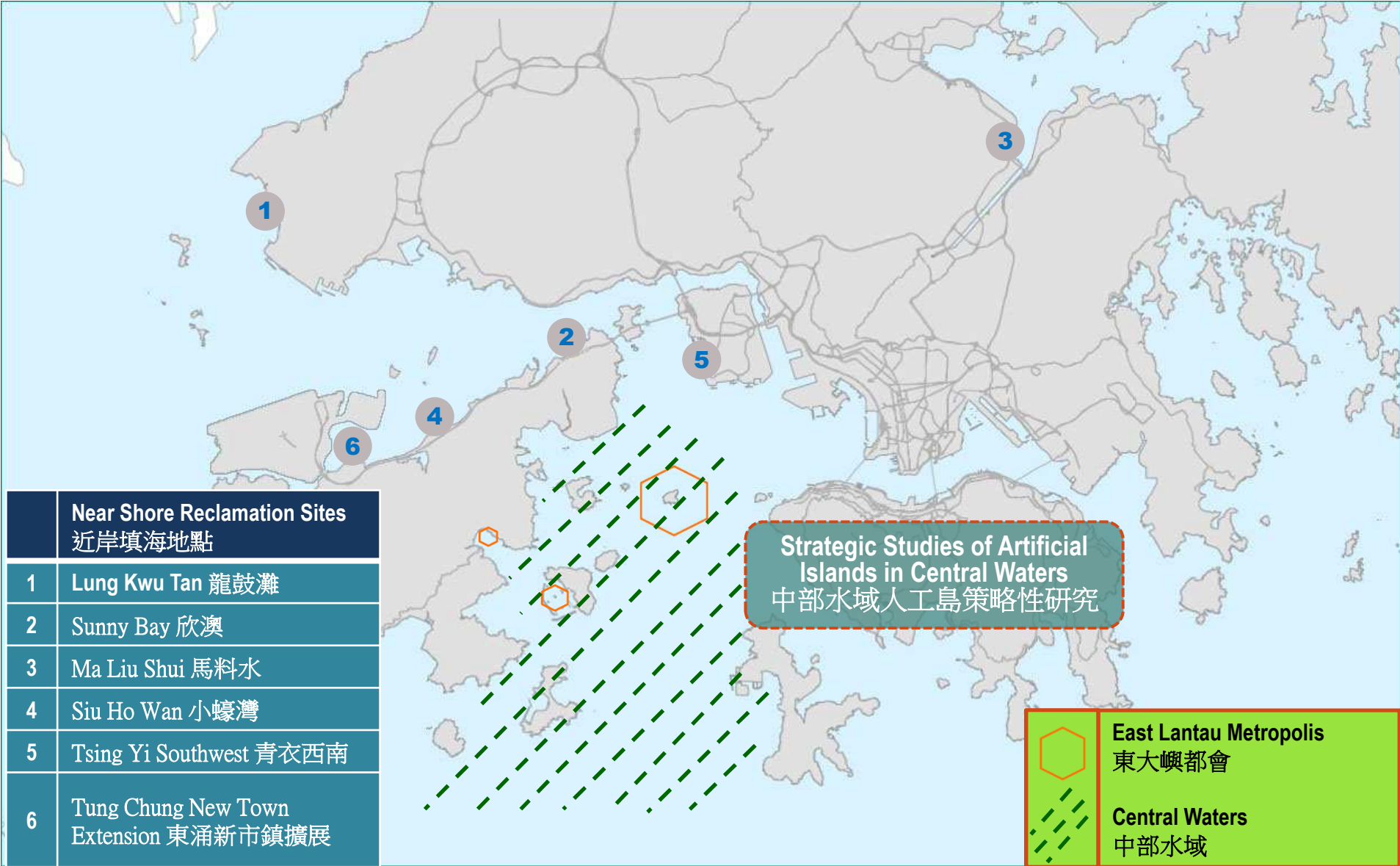
**Figure 2**  
圖二





# Reclamation outside Victoria Harbour 維港以外填海

Figure 3  
圖三



# Typical Programme for Reclamation Project 一般填海工程的時間表

Figure 4  
圖四

