



Agreement No. CE 25/2001
Hong Kong 2030: Planning Vision and Strategy
Strategic Environmental Assessment

Executive Summary

June 2007

Planning Department

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Planning Vision and Strategy –
Strategic Environmental Assessment**

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June 2007

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**AGREEMENT NO. CE 25/2001
HONG KONG 2030:
PLANNING VISION AND STRATEGY
STRATEGIC ENVIRONMENTAL ASSESSMENT**

EXECUTIVE SUMMARY

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E.1 INTRODUCTION

E.1.1 The Hong Kong 2030: Planning Vision and Strategy (HK2030 Study) is a strategic planning study tasked with preparing a strategic land use planning framework for Hong Kong up to year 2030. The HK2030 Study has addressed ‘how much, what type and where land for development should be provided’. The Government is committed to supporting and promoting sustainable development and thus major policy and strategy initiatives have undergone a sustainability assessment. Under the overarching goal of adhering to the principle of sustainable development one of the planning objectives of the HK2030 Study is to provide a good quality living environment. To assist in achieving this aim we need to strike a balance in the demand for, and supply of, environmental resources, and as such an integral component of the HK2030 Study is the Strategic Environmental Assessment (SEA).

E.1.2 The stated objectives of the SEA include the establishment of environmental “objectives” in order to achieve a good quality environment to support Hong Kong’s position as Asia’s world city. Furthermore, future developments need to be considered in terms of the environmental and infrastructural carrying capacity currently in place and planned for the future. The SEA is also charged with assisting in the development and refinement of the options to derive a Preferred Development Option using strategic evaluation techniques. Ultimately the SEA is charged with identifying environmental mitigation measures and follow up investigations that may be required including policy and institutional arrangements.

E.1.3 The SEA process has included various tasks that have contributed to each stage of the HK2030 Study by:

- providing, during Stage 1 of the HK2030 Study, a baseline review and setting up environmental “objectives”;
- examining, during Stage 2, the key issues and evaluation criteria and highlighting the most important issues for further analyses in the subsequent stages of study;
- providing, during Stage 3, a broad-brush and qualitative assessment and comparing the environmental performance of the two development options, viz. the Consolidation and Decentralization Options, which have been put forth for public consultation; and
- carrying out, in Stage 4, more detailed performance evaluation of the Preferred Development Option formulated on the basis of the Reference Scenario¹ and

¹ Under the HK2030 Study, Reference Scenario is set out as what we envisage the future will be like based on the broad trends and vision objective, and by taking into account existing policies and known commitments. The key assumptions and considerations used in deriving the Reference Scenario include population, employment, land requirements for various types of use such as housing, economic, transport and key infrastructures. Based on the results and recommendations of the SEA and other detailed assessments, the Preferred Development Option for the HK2030 Study will then be formulated and, during the course, refinements will be made, if found necessary.

On the other hand, to cater for uncertainties and to allow us to respond quickly to changes and thereby enhancing the robustness of our development strategy, alternative scenarios, i.e. “What If” Scenarios have also been prepared. For the purpose of the HK2030 SEA, we have selected the worst-case development option, viz. high population and high economic growth assumptions with possible container terminal location at northwest Lantau, for sensitivity testing.

suggesting refinements, if necessary, in the process of the formulation of the Preferred Development Option of the HK2030 Study, and drawing up strategic environmental action plan and programme for implementation of the development strategies.

- E.1.4 The ultimate goal of the SEA is to ensure that the development strategies formulated under the Study can be realised in a sustainable manner, taking full cognisance of the strategic implications of the proposals as well as their individual components.
- E.1.5 In the early stages of the Study the development options were formulated taking account of the vision objective for Hong Kong and current broad trends as well as existing policies and commitments. This allowed key elements of development and their land requirements to be established. Various planning choices were thus derived to accommodate the additional land requirements. Key components of the plans included population growth/reduction; transport and cross-boundary considerations. Having considered the implications of various planning choices the core components were defined as either a “consolidated pattern” or a “decentralised pattern”.
- E.1.6 Under the SEA only two of the container terminal locations examined in the Study on Hong Kong Port – Master Plan 2020 were considered, viz. South West Tsing Yi and North West Lantau. The East Lantau site was rendered invalid due to the Hong Kong Disneyland Project, while the Tuen Mun West site is limited by the high volumes of marine traffic present in Urmston Road and strong ocean currents.
- E.1.7 Evaluations of the core components were assessed in the early stages of the SEA using a series of performance indicators. These were developed to allow a clear format for identifying environmental benefits and disbenefits of each option. Four options were thus considered, i.e. for each of the two development patterns and for the two container terminal locations. The evaluations were qualitative and based on the likely performance when judged against other options, and the likely environmental impacts were highlighted. However it was not possible to determine whether or not the options would achieve all environmental standards and criteria due to the strategic nature of the appraisals.
- E.1.8 From the Option Evaluation it was identified that in the short-term the potential air and noise problems identified were a consequence of the cross-boundary vehicle trips. The population exposed to road traffic noise is subject to population distribution, population density and traffic flow. Given the same traffic flow, the denser the population in an area, the higher will be the population exposure level. No novel components were included in the short-term as all the projects were committed or planned. In the medium to longer term the issues that were identified as being of concern included vehicle emissions, wastewater disposal, generation of solid wastes and the treatment/disposal thereof.
- E.1.9 Following on from the Options Evaluation the Preferred Development Option formulated on the basis of the Reference Scenario was drawn up. The Reference Scenario sets out the context against which development options are drawn up. In effect it represents a translation of the vision into planning objectives and parameters and reflects the three strategic planning directions that have been identified for the future development of Hong Kong :

- (a) *Providing a quality living environment* – In line with the emphasis of the Population Policy on quality of our population to meet the challenges of a knowledge-based economy and world-class city, a population growth of about 1.6 million is projected (instead of a million a decade as in the past), reaching some 8.4 million by year 2030. As a result of this growth, public housing becomes a concern; long-term land supply is a problem that has yet to be fully addressed, even with the additional land supply by the proposed New Development Areas (NDAs). There should be a greater supply of land in order to provide a more spacious living environment; more convenient connections with work places and facilities; better protection of natural resources, environmental carrying capacity and natural landscape, which is of ecological, geological, scientific and other significance; and cultural heritage, as well as better urban design complementary to the image of a world city.
- (b) *Enhancing economic competitiveness* – In terms of enhancing economic competitiveness, the role of town planning is to ensure provision of adequate and timely delivery of land of the right kind to meet various needs of the economy, especially the four pillar industries.
- (c) *Strengthening links with the Mainland* – Closer social and economic integration with the Pearl River Delta (PRD) region calls for planning consideration in the wider regional context. The key is to enhance connectivity, which allows freer movements of people, vehicles and goods. Important elements will be the planning of cross-boundary infrastructure and associated boundary-crossing facilities, as well as the future development of the Frontier Closed Area (including the Lok Ma Chau Loop) and Northern New Territories.

E.1.10 The Reference Scenario on which the Preferred Development Option is developed is described in more detail in the following section.

E.2 FRAMEWORK FOR DEVELOPMENT

- E.2.1 The framework for the development proposed or assumed under the Preferred Development Option (**Figures E1 to 3**) formulated on the basis of the Reference Scenario and the “What If” Scenario is contained in **Annex** to this Executive Summary. The details include the population and employment statistics, housing land requirements and economic land requirements, as well as providing details on the requirements for the port and related facilities. This framework underpins the assessments that have been carried out under the SEA for the HK2030 Study.
- E.2.2 Strategic road and rail networks form an integral component of the HK2030 strategies and the assumptions upon which the strategies are summarized in **Annex**. Details of the committed rail projects by 2010 are provided as are those proposed for the period between 2010 and 2020, as well as for the longer term to 2030. Similarly, for the road network **Annex** provides a breakdown of the committed or assumed highway projects up to 2010, between 2010 and 2020 and between 2020 and 2030. In addition to the highway network details the cross-boundary road traffic data are summarized for the 2003 base year and projections for the 2010, 2020 and 2030 in **Annex**.
- E.2.3 Other strategic infrastructure requirements are also provided in **Annex** include the provision of water supply, alternative sources of water supply, the sewage treatment and waste management infrastructure required to accommodate the liquid and solid waste arising.
- E.2.4 Other strategic developments that are expected to take place within the timeframe of the HK2030 Study include the Ocean Park Redevelopment, the Tseung Kwan O Further Development, West Kowloon Cultural District and others are listed in **Annex**.
- E.2.5 Under the HK2030 Study a series of “What If” or sensitivity tests have been developed using different key planning parameters. For the purpose of the HK2030 SEA, only the worst-case development scenario, viz. high population and high economic growth with the future container terminal location assumed at North West Lantau, has been selected for sensitivity test. The key planning assumptions and development parameters assumed under this “What If” Scenario are provided in **Annex**.

E.3 ASSESSMENT OF THE PREFERRED DEVELOPMENT OPTION

SEA EVALUATION METHODOLOGY

- E.3.1 The evaluation of the Preferred Development Option formulated on the basis of the Reference Scenario was conducted using a similar approach to that of the Options Evaluation assessment in that all available information was considered in terms of the environmental implications of the Reference Scenario as well as the components thereof. Modelling for air quality and noise were undertaken reflecting the potential significance of the development proposals on these two media. For air quality the modelling was undertaken using the PATH model which is a strategic modelling tool developed for assessing trends and predicts the district-wise air quality and deploying the use of detailed emissions inventories. It should be noted that the 2030 emission inventories are projected based on a lot of assumptions and uncertainties and it is broad-brush in nature; the future development and infrastructure which may have territory-wide implications and would likely worsen the air quality. The predicted trend of air quality may only be achieved if many effective improvement measures materialize. Given the uncertainties in the projection, there is a chance that air quality will deteriorate in future.
- E.3.2 For noise the model used was LIMA which is similarly suited to considering the strategic implications of the transport strategy. Note that for air quality all pollution sources (including point, marine, aircraft, vehicle traffic, biogenic) were considered, but for noise only road-based vehicles were modelled and assessed for Year 2003 and 2030 and qualitative assessment were undertaken in other milestone years. Other major noise sources, such as aircraft, industrial noise, etc. had been qualitatively assessed as part of the SEA exercise.
- E.3.3 For the water quality assessment heavy reliance was placed on the use of modelling results of ongoing / recently completed consultancy studies or key infrastructure projects by interpolation or extrapolation.

STRATEGIC ASSESSMENT ON IMPACTS OF THE PREFERRED DEVELOPMENT OPTION FOR THE SHORT TERM (BASELINE – YEAR 2010)

- E.3.4 In the short-term, from a planning perspective there is little difference between the two container terminal development options (i.e. South West Tsing Yi and North West Lantau) under the Preferred Development Option formulated on the basis of the Reference Scenario. The projected population for Year 2010 is 7.2 million, which is about 5.7% increase as compared to those of the baseline year (6.8 million). The percentage changes in population in individual districts ranged from -2.1% to +26.5%. There are four districts including Sai Kung, Sham Shui Po, Tsuen Wan and Yuen Long with an increase in population of over 10%. The environmental implications are summarised in **Table E1**.

STRATEGIC ASSESSMENTS ON IMPACTS OF THE PREFERRED DEVELOPMENT OPTION FOR THE MEDIUM TERM (UPTO YEAR 2020)

- E.3.5 The differences in environmental impacts among the two container terminal options (viz. South West Tsing Yi and North West Lantau) under the Preferred Development

Option formulated on the basis of the Reference Scenario are much more significant in the medium to long-term than in the short-term.

- E.3.6 The projected total population is about 7.8 million for Year 2020, which is an increase of about 14.8%, compared to the baseline year. The population is expected to increase in all districts except for Eastern (-2.1%) and Wong Tai Sin districts (-4.7%). The environmental implications are summarised in **Table E1**.

STRATEGIC ASSESSMENT ON IMPACTS OF THE PREFERRED DEVELOPMENT OPTION FOR THE LONG TERM (UPTO YEAR 2030)

- E.3.7 The resident population at Year 2030 is assumed to be 8.4 million which is 1.6 million higher than the base year. The environmental implications are summarised in **Table E1**.
- E.3.8 Nevertheless, it should be stressed that the SEA assessment results and findings as summarised in **Table E1** are only valid for the set of assumptions adopted and the effective implementation of those projects / measures that have been taken into account in the modelling and assessment and any change in these basic assumptions / parameters may yield different results.
- E.3.9 In addition, there would likely be cumulative on-site and off-site environmental issues including water, air quality, aircraft noise and traffic noise, sewerage infrastructure, ecology, visual impact, hazard, landscape and cultural heritage effects due to the implementation of various major developments such as the NDAs, cross-boundary infrastructure, possible uses of the Closed Area and the future airport and port developments. Some of these cumulative environmental issues would have territory-wide implications and might also affect the long-term environmental sustainability of Hong Kong. For example, the cumulative impacts of the future port and airport developments may present environmental problems. At present, the feasibility studies and environmental assessments of the proposed development projects are yet to be completed. Detailed environmental studies are necessary to determine their environmental acceptability. There are proposals of tourism and organic farming, the implementation details should be worked out in such a way to minimize the adverse environmental impact. Strategies to address the problem of proliferation of Port Back Up uses in rural area are required.

Table E1 Summary of Environmental Impacts for the Preferred Development Option formulated on the Basis of the Reference Scenario

Environmental Discipline	Baseline to 2010	Year 2011 to 2020	Year 2021 to 2030
Air Quality	Air quality improvements will begin to be perceptible as the policy measures will be partly implemented. General growth in the various sectors would have negative impacts.	Most important works currently planned will be completed while most policy measures will be fully implemented. The strategy is expected to have the maximum effects on the medium-term. Further measures will be required to build on the benefits gained by 2020.	<p>The Preferred Development Option formulated on the basis of the Reference Scenario and its associated development strategy demonstrates that there are general improvements in the air quality in HKSAR with the implementation of the committed control measures. However, the concentration of some air pollutants in some areas would worsen. It implies that more air pollution control measures should be explored.</p> <p>Comparing two container terminal options under the Reference Scenario, for the North West Lantau container terminal option under the Reference Scenario, the highlighted affected area is found in North West Lantau while for the South West Tsing Yi container terminal option under the Reference Scenario, the highlighted affected area is found in Tsing Yi and Tsuen Wan.</p> <p>The difference for two possible container terminal location under the Reference Scenario is due to the marine vessels emissions in different container terminal location, and the different transport networks.</p>
Noise	<p>The population affected by noise is expected to increase mainly due to the increase in population and road traffic volume.</p> <p>Compared to the road traffic noise impact, the impact from other noise sources is insignificant although the aircraft noise impact is expected to increase as a result of the projected increase in the air traffic volume.</p>	<p>The population affected by the road traffic noise is expected to increase due to the increase in both population and traffic volume. The difference in the traffic noise impacts between the two container terminal options under the Reference Scenario will be mainly limited to Lantau or Tsing Yi districts where the proposed new container terminal locate.</p> <p>The noise impact from aircrafts and railways is also expected to increase resulting from the projected increase in the air traffic volume and proposed new rail</p>	Some improvements are likely to be seen in Eastern, Kowloon City, Kwun Tong, North, Sai Kung, Sha Tin, Tai Po, Tuen Mun, Wan Chai and Yuen Long districts. However, more population will be exposed to excessive road traffic noise level in Central and Western, Islands, Kwai Tsing, Sham Shui Po, Southern, Tsuen Wan, Wong Tai Sin and Yau Tsim Mong districts. The total population exposed to excessive road traffic noise level is expected to further increase to some 1.40 million or 17% of the total projected population due to the projected increase in both population and road traffic. The difference in the noise impact between the two container terminal locations under the Reference Scenario will be mainly limited to the Lantau or Tsing Yi districts where the proposed new container terminal locates.

Environmental Discipline	Baseline to 2010	Year 2011 to 2020	Year 2021 to 2030
		links. However, compared to the road traffic noise impact, the impact from aircrafts, railways and other noise sources is insignificant.	The noise impact from aircrafts and railways is expected to continue to increase as a result of the projected increase in the air traffic volume and the new rail links.
Water Quality	<p>Western Buffer Water Control Zone (WCZ) would continue to experience high bacterial level until the implementation of the disinfection facilities at Stonecutters Island (SCI) Sewage Treatment Works (STW).</p> <p>The bacterial level in Victoria Harbour WCZ and Western Buffer WCZ is expected to decrease significantly due to the provision of the disinfection facilities at SCI STW, which may lead to the re-opening of the bathing beaches in the Tsuen Wan area.</p> <p>The physical presence of the newly reclaimed land for the development of the North West Lantau container terminal option under the Reference Scenario may start to potentially disrupt the sewage outfall at Tai O STW whilst the land reclaimed for the South West Tsing Yi container terminal option under the Reference Scenario will have the potential to adversely affect the dispersion of the sewage discharged from the SCI STW.</p>	<p>Generally, there will be an improvement in the overall water quality within Hong Kong in 2020, compared with the baseline condition and 2010.</p> <p>The local pollution load discharged from Hong Kong to Deep Bay, North Western and Southern WCZs will be significantly reduced. As a result, the background pollution level from the Pearl River and the Shenzhen catchment will be relatively more influential to the water quality in those WCZs, particularly in terms of nitrogen level.</p> <p>The pollution level (in particular the bacterial level) in Victoria Harbour WCZ and Western Buffer WCZ will decrease significantly due to the implementation of Harbour Area Treatment Scheme (HATS) Stage 2A, which may lead to the re-opening of the bathing beaches in the Tsuen Wan area.</p> <p>Implementation of HATS Stage 2B (subject to a review of the timing for implementation to be carried out in 2010 / 11) is believed to further benefit the water quality in Western Buffer, North Western and Southern WCZs.</p>	<p>The local pollution load discharged from HKSAR to Deep Bay, North Western and Southern WCZs will be significantly reduced. As a result, the background pollution level from the Pearl River and the Shenzhen catchment will become, relatively speaking, more influential to the water quality in those WCZs, particularly in terms of the nitrogen level.</p> <p>The pollution level in Victoria Harbour WCZ and Western Buffer WCZ, bacterial level in particular, will decrease significantly owing to the implementation of HATS Stage 2A, which may lead to the re-opening of the bathing beaches in the Tsuen Wan area.</p> <p>The North West Lantau container terminal option under the Reference Scenario is expected to cause disruption to the existing sewage outfall of Tai O STW and will require the reprovisioning of the outfall. It has little impact on the marine water quality in Hong Kong.</p> <p>Some adverse impact on the dispersion of the pollution discharged from the SCI STW may result from the physical presence of the port facilities under the South West Tsing Yi container terminal option of the Reference Scenario.</p>

Environmental Discipline	Baseline to 2010	Year 2011 to 2020	Year 2021 to 2030
		<p>The physical presence of the port facilities under the North West Lantau container terminal option under the Reference Scenario will have the potential to cause disruption to the existing sewage outfall of Tai O STW and will require the re-provisioning of the outfall.</p> <p>The physical presence of the South West Tsing Yi container terminal option under the Reference Scenario will alter the tidal flow patterns in the Western Buffer WCZ and hence may adversely affect the dispersion of the pollution discharged from the SCI STW.</p>	
Waste	<p>Little change in current status is anticipated. However, disposal of a greater volume of mud from construction dredging and maintenance dredging of the container terminal will be required.</p> <p>The delivery of inert construction and demolition (C&D) material for beneficial use in Mainland reclamation projects commenced in 2007. The clearance of the existing stockpiles of inert C&D material at Government fill banks will depend on the availability of suitable public fill outlets within Hong Kong and the success of using this material in the Mainland in the coming years.</p>	<p>Little change in current status, however, disposal of a greater volume of mud from maintenance dredging of the container terminal will be required and this may result in the need to extend/replace the existing mud disposal areas.</p> <p>However, a smaller volume of mud will be generated from maintenance dredging of South West Tsing Yi container terminal option under the Reference Scenario, compared to North West Lantau container terminal option under the Reference Scenario.</p> <p>The delivery of inert C&D material for beneficial reuse in Mainland reclamation projects may need to continue if local public fill outlets remain insufficient.</p>	<p>Municipal and solid waste generation is likely to have stabilised or begun to decrease.</p> <p>Under the South West Tsing Yi container terminal option of the Reference Scenario, the volume of mud to be disposed of from maintenance dredging of the new container terminal will be smaller than that of the North West Lantau container terminal option. However, this will still result in the need to further extend/replace the existing mud disposal areas.</p>

Environmental Discipline	Baseline to 2010	Year 2011 to 2020	Year 2021 to 2030
Energy and Natural Resources	Little change in current status.	<p>Unless controlled, demand will continue to rise. Nevertheless, it is believed that comprehensive transport planning and the use of environmentally friendly modes of transport could help to reduce energy consumption, particularly through the development of NDAs.</p> <p>The environmental performance of the two container terminal options under the Reference Scenario are considered similar in terms of energy consumption.</p>	Same as in year 2020.
Landscape and Visual	Little change in current status.	<p>For the North West Lantau container terminal option under the Reference Scenario, the port development site is incompatible with the existing quiet, untouched North West Lantau. Impact on the regional landscape is assessed to be significant.</p> <p>For the South West Tsing Yi container terminal option under the Reference Scenario, the port facilities are assessed to be more compatible with the heavily urbanised Tsing Yi Island. No significant change to the current status is anticipated.</p>	Same as in year 2020.
Ecology	The housing and business development/ redevelopments to be completed before 2010 are mainly located within existing built-up areas, hence impose no significant impact on ecology.	<p>For the North West Lantau container terminal option under the Reference Scenario, Lantau Port potentially affects significant ecological resources such as Chinese White Dolphin habitat.</p> <p>For the South West Tsing Yi container terminal option under the Reference Scenario, Tsing Yi Port is considered to be</p>	Same as in year 2020.

Environmental Discipline	Baseline to 2010	Year 2011 to 2020	Year 2021 to 2030
		<p>a less ecologically sensitive location.</p> <p>Under the Reference Scenario, some infrastructure proposals and NDAs may have impact on some areas of concern, for example, Kwu Tung North is not far away from the freshwater habitat in Long Valley. Environmental and ecological studies would need to be undertaken to ensure the potential impacts on the ecology could be avoided or mitigated.</p>	
Cultural Heritage	Little change in current status.	Subject to further studies and assessments be undertaken to ensure the heritage conservation acceptability of the affected heritage / sites at the planning and implementation stage.	Same as in year 2020.
Risk Management	No change in current status as no new Potentially Hazardous Installations (PHIs) will be built.	<p>Planning controls could help avoid interfaces between residential developments and PHIs.</p> <p>In comparison, the South West Tsing Yi container terminal option is believed to have relatively more significant consequences with regard to potentially hazardous materials, requiring the relocation and reprovisioning of existing PHIs.</p>	Same as in year 2020.

E.4 EVALUATION OF THE STRATEGIES

INFRASTRUCTURE AND TRANSPORT STRATEGIES

- E.4.1 In addition to the above evaluation, which primarily focused on the planning framework of the Preferred Development Option and specifically on the port related development options, the SEA also assessed the environmental performance of other development strategies.
- E.4.2 Development and upgrading of public transport links will continue to provide citizens with a realistic alternative to private car ownership. This would result in a reduction in overall vehicle exhaust emissions and improved air quality.
- E.4.3 Improvements, reconstruction, widening etc. of roads of the existing road network will help to “ease” traffic in some areas, thus leading to improvement in both air quality and noise environment in currently congested areas. However, improvement of the existing network and development of future links imply large increases in road traffic movement. These increases would come along with localized deterioration of air quality and noise environment along the improved/new built links in already polluted areas, but would also impact currently unaffected areas with good air quality and noise environment. Further detailed assessment would need to be conducted during the project implementation stage to mitigate any likely noise exceedance or air pollution by planning and design measures.
- E.4.4 Planned railways, such as the Northern Link and the Hong Kong Section of the Guangzhou-Shenzhen-HK Express Rail Link, may require land take and may affect ecologically sensitive areas in the New Territories and detailed assessments are needed to be carried out to study the need / feasibility of mitigation measures including the use of tunnels rather than above ground options for sensitive sections of alignments.
- E.4.5 The projected increase in passenger and cargo are expected to increase NO_x emission as well as population exposure to excessive noise. The reclamation for a third runway at Hong Kong International Airport (HKIA) may also have impacts on marine water quality and ecology. The cumulative effect of the airport expansion, the proposed North West Lantau container terminal option under the Reference Scenario (if selected) and the proposed Hong Kong Zhuhai-Macao Bridge (HZMB) should be thoroughly assessed and properly mitigated in the future. The location of Hong Kong Boundary Control Facilities (BCF) for the HZMB is currently the subject of a study by the HZMB Advance Work Co-ordination Group. The Governments of Guangdong, Hong Kong and Macao have commissioned a consultant to conduct a study on the locations and arrangements of the BCF under the mode of “Separate Location of BCF” for the HZMB. Further detailed assessment would need to be conducted during the project implementation stage to mitigate any likely noise exceedance or air pollution by planning and design measures.
- E.4.6 The Airport Authority Hong Kong (AA) had, in December 2006, released an update of the Master Plan (known as HKIA 2025) which recommends, among others, the carrying out of engineering and environmental feasibility studies on the construction of a third runway at the HKIA. It is believed that the third airport runway, together

with the final decision on the new container terminal, may have implications on the overall development pattern for Hong Kong, in particular from the strategic environmental assessment perspective. In addition, the cumulative effects of reclamation for construction of the third runway in relatively close proximity to the possible new container terminal at North West Lantau (if selected) will need to be carefully assessed in terms of the effects on marine water quality, flows and marine ecology.

- E.4.7 Whilst we have taken into consideration both locational options for the new container terminal under the HK2030 SEA, we do not have adequate details on the third runway at the time when the SEA was undertaken. Nevertheless, it is advised that the Government should wait until the outcome of AA's studies are available and consider, at that stage, the need for updating the planning strategy of the HK2030 Study.
- E.4.8 Hong Kong currently relies heavily (more than 80%) on importing water from Dongjiang River for its drinking water supply. As other cities in Guangdong are fighting for more and more water supply from Dongjiang River, further measures may need to be explored, like the Total Water Management strategy currently being conducted, to reduce water consumption, to minimise wastage, to encourage wastewater reuse and to explore alternative water resources.
- E.4.9 The majority of the sewage in Hong Kong currently receives only preliminary or primary treatment. Even after the implementation of HATS Stage 2A, the percentage of sewage receiving only preliminary or primary treatment will remain high. There should be continued programmes for upgrading the treatment facilities in terms of capacity and treatment level so as to cater for population growth and any water quality needs. The effort would help Hong Kong to achieve the status as a World City in Asia.
- E.4.10 The routing of marine traffic will need to be well planned in order to prevent overlapping and cumulative oil spill from vessels.

NEW DEVELOPMENT AREAS (NDAS)

- E.4.11 NDAs have to be matched with adequate utilities including water supplies, wastewater collection and treatment systems, electricity supplies, efficient transport infrastructure, etc. All these facilities could have potential implications in terms of PHIs, which should be properly addressed during the planning and implementation stage. The development of NDAs and associated facilities should take careful consideration of cultural heritage and ecological conservation and protection.
- E.4.12 Relocating population from the traffic-congested built-up metro area to the NDAs provides opportunities to reduce the population exposed to excessive noise and air pollution. The future noise and air quality environment of the NDAs has been assessed on a broad-brush basis. Further detailed assessment should be conducted during the project implementation stage to mitigate any likely noise exceedance or air pollution by planning and design measures.

CROSS-BOUNDARY ISSUES

- E.4.13 Within the PRD region, rising human population, increasing use of natural resources and a steady reduction in agricultural land area has led to increasing environmental pollution and adverse ecological impacts. These activities not only have a severe impact on the sustainability of the PRD, but also because Hong Kong is affected by these activities, they will act as a considerable environmental constraint on Hong Kong.
- E.4.14 The water quality in Deep Bay, Northwestern and Southern WCZs is subject to cross-boundary pollution. With the continuing implementation of the wastewater collection and treatment schemes in Hong Kong, cross-boundary pollution is expected to become, relatively speaking, more influential in these waters.
- E.4.15 Cross-boundary air pollution is also a major environmental issue facing Hong Kong. Whilst the emission trading mechanism provides a means for Hong Kong to assist in reducing pollution generated from the PRD region, persistent and concerted effort will be required from both Hong Kong and Guangdong Provincial Governments in order to significantly improve the air quality in the region.
- E.4.16 Cross-boundary transport, including air, marine, rail and road, is expected to continue to grow in the foreseeable future, and will all add additional pressure to the air quality and noise environment in Hong Kong as well as in Guangdong. Thorough study and a careful planning will be required for any new cross-boundary transport infrastructure.

E.5 “WHAT IF” SCENARIO

- E.5.1 The “What If” Scenario, with the future container terminal location assumed at North West Lantau, was modelled to ascertain the implications of the “worst case” situation as sensitivity test under the HK2030 SEA.
- E.5.2 The implication on air quality under the “What If” Scenario exhibits a general small increase in SO₂ concentration in Kowloon, New Territories and NW Lantau. It is due to the increase in road traffic emissions and marine vessel emissions. For NO₂, an increase in NW Lantau is expected; it is the results of increase in marine traffic activities. For O₃, a decrease in North West Lantau is anticipated; this can be explained by the increase in NO_x concentrations in North West Lantau container terminal option under the Reference Scenario as the increase in marine NO_x emissions which lead to lower ozone level. In general, model results of the “What If” Scenario show similar pattern as North West Lantau container terminal option under the Reference Scenario.
- E.5.3 As for noise impact, the total population exposed to a road traffic noise level exceeding 70 dB(A) will be similar under both possible container terminal options of the Reference Scenario and the “What If” Scenario, at about 1.40 million, or 17% of the total projected population.
- E.5.4 It is also observed that the population exposed to a road traffic noise level of exceeding 70 dB(A) is similar between the two scenarios. For Central and Western, North, Tai Po, Tuen Mun and Yuen Long districts, the differences are less than 0.5%. The number of population exposed to excessive traffic noise impact would slightly increase in Central and Western, Tuen Mun and Yuen Long districts due to the increase in traffic volume.
- E.5.5 For Tai Po district, the population exposed to excessive traffic noise impact is expected to decrease slightly. This is due to the changes in the traffic flow pattern in “What If” scenario. The traffic flow of the roads within the town centre would decrease slightly whereas the traffic flow of Tolo Highway would increase compared to the North West Lantau container terminal option under the Reference Scenario, resulting a reduction in the number of population exposed to excessive traffic noise impact. For Islands district, the population exposed to a road traffic noise level of > 70 dB (A) in “What If” Scenario is 4.9 % higher than those of the North West Lantau container terminal option under the Reference Scenario. This is mainly due to the increase in both traffic volume and population.
- E.5.6 Compared to the road traffic noise, the noise situation of the other noise sources is similar although the impact of the railway noise and aircraft noise is expected to increase as a result of the proposed new rail links and projected increase in the air traffic volume.
- E.5.7 An increased population under the “What If” Scenario would put increased demand and pressure on the sewage treatment facilities. Water quality is likely to deteriorate if the discharge quantity exceeded the treatment capacity of the STWs. An increased population would increase the demand upon water supplies. Greater demand management would have to be invoked in Hong Kong to reduce per capita

consumption through programmes such as the Government's "Total Water Management" Programme.

- E.5.8 As for landscape implication, the adverse impact on the western end of Lantau will remain the same to the North West Lantau container terminal option under the Reference Scenario. The additional population growth will be confined within the urbanised areas. All developments which relate to the increased population will be assessed according to Town Planning Ordinance.

E.6 ENVIRONMENTAL ENHANCEMENTS

E.6.1 The HK2030 Study is a strategic land use planning study, which aims to introduce sustainable development up to 2030 and concomitantly to improve the quality of the living environment in Hong Kong. Through these strategic aims, it is considered that the HK2030 Study should also contribute materially towards supporting Hong Kong's aspirations as Asia's world city, with a good quality living environment.

E.6.2 The section aims to provide a way forward and to describe the solutions and mechanisms that are, either already in place, or that need to be recommended for implementation to make their contribution towards the improvement of Hong Kong's overall living environment.

E.6.3 Importantly, the following mechanisms comprise suggestions for initial consideration and are not committed items. In addition, it is important to note that there is a need to objectively consider and analyse in detail the various related limitations and factors such as technical practicality, public consensus, resources implications and political/cross border recognitions before taking forth suggestions to their next stage. The proposed solutions and mechanisms can be classified in the following ways and are detailed in **Table E2** below.

- Quick Wins: Existing and Recommended Short-term Mechanisms Yielding Benefits to Existing Environmental Conditions;
- Slow Burners: Existing and Recommended Medium-term Mechanisms Yielding Benefits to Future Environmental Conditions; and
- Long Termers: Existing and Recommended Future Long-term Mechanisms Yielding Benefits to Future Environmental Conditions.

Table E2 Implementation Initiatives

Classification	Discipline	Possible Solutions/Mechanisms
Q	<i>Air</i>	1. Emission cap targets for power generation.
		2. Accelerate permitting of low emission fuel (LNG) projects.
		3. Restrict coal-fired generation in Hong Kong to ultra low sulphur coals.
		4. Institute public education and debate on Greenhouse Gas and climatic change and consequence for inaction to Hong Kong sea levels and area in case of no action.
		5. Reconsideration of introduction of modern forms of environmentally friendly public transport vehicles for use in new reclamation areas or NDAs.
		6. Encourage the use of more environmentally friendly vehicles passing through areas such as Causeway Bay and Mid Levels.
		7. Consider voluntary expansion of Action Blue Sky Campaign linked with a wider dissemination of HKSARG's signature of the Clean Air Charter to Hong Kong-owned industrial businesses manufacturing within the PRD to engender a 'ripple effect'.
Q	<i>Noise</i>	1. Introduction of low noise surfaces to highly impacted, high density areas.

Classification	Discipline	Possible Solutions/Mechanisms
		2. Prioritized introduction of noise mitigation and noise barriers to highly impacted, high density areas.
		3. Specification of benchmark quiet construction plant.
Q	<i>Water Resources and Water Quality</i>	1. Timely implementation of sewerage master plans and elimination of expedient connections.
		2. Launch community education campaign to promote water conservation.
Q	<i>Waste</i>	1. Active promotion of Hong Kong 'EcoPark' and local recycling industry.
		2. Government to take the lead in green procurement and use of recycled products.
		3. Provision of adequate waste separation facilities in new public housing estates.
		4. Ban wasteful and excessive packaging.
		5. Urban renewal should give priority to building reuse/recycling rather than demolition and redevelopment, i.e. urban renewal should be based upon the principle of reuse and recycling the old building first and only if this is proven non feasible should demolition and redevelopment be considered.
Q	<i>Energy and Natural Resources</i>	1. Electricity grid interconnection, urgent reconsideration by consultancy study.
		2. The Government should give priority to environmentally friendly vehicles that meet EPD's specified qualifying standards for tax incentives when government vehicles are due for replacement, subject to operational requirements and the rational utilisation of resources. In the short-term (Q) this could, for example, comprise replacement of certain existing petrol or diesel-based vehicles in the HKSARG fleet with hybrid vehicles.
		3. Institute vigorous energy conservation campaign.
		4. Government lead energy reduction scheme with a 20% target, overarching aim being a 20% reduction in Government energy consumptions.
		5. Classify waste-to-energy as Renewable Energy.
		6. Introduce waste separation at source schemes.
Q	<i>Land Use and Landscape</i>	1. Redevelop vacant factory buildings for other uses such as 'loft' type development.
		2. Introduce planning / design competitions for key planning areas and / or buildings.
		3. Establishment of 'Green Links' between harbourfront area and urban hinterland areas.
		4. Improve harbourfront by greening and natural shading.
		5. Implement or further expand the pedestrianisation areas in Central, Causeway Bay and Tsim Sha Tsui to other urban districts and NDAs.
		6. Seize opportunities for increasing width of street canyons through urban renewal and redevelopment projects.
		7. Increase landscape recurrent cost / budget to engender a good quality urban environment through creative means.
		8. Establishment of 'Green Corridors' such as parks and open space connectors to provide links for people to enhance access between urban and hinterland areas.
Q	<i>Ecology</i>	1. Implementation of the New Nature Conservation Policy.

Classification	Discipline	Possible Solutions/Mechanisms
		2. Implement the pilot scheme on management agreement and private public partnership promulgated under the new nature conservation policy for the enhanced conservation of ecologically sensitive private land at the priority sites. 3. Consider designation of the ecologically important parts of the Frontier Closed Area as new ‘Country Parks’ and / or conservation zone. 4. Adoption of international best practices and ecologically sensitive drainage schemes. 5. Consider habitat restoration of channelized streams.
Q	<i>Cultural Heritage</i>	1. Immediate integration of conservation of cultural heritage resources into the planning mechanism to achieve gains for the community. 2. Consideration of partially retention of marginal cultural resources, e.g. facadeism.
Q	<i>Others</i>	1. Consideration of a ‘green tax’ or electricity tax to implement the “polluter-pays” principle in order to induce behavioural changes among the public and encourage reduction and recycling through direct economic incentives. 2. Government to take the lead in the advancement of environmentally-friendly building design. 3. Update codes for environmental protection, energy efficiency and materials conservation.
S	<i>Air</i>	1. SO _x , NO _x and Particulate emission trading schemes for Hong Kong and PRD coal-fired power stations. 2. Cooperate with State Development and Reform Commission to introduce low sulphur diesel to road transportation fleets to PRD. 3. CO ₂ emission trading schemes for Hong Kong and PRD coal-fired power stations. 4. Review of bus network to minimise route duplication and rationalise bus network.
S	<i>Noise</i>	1. Introduction and incorporation of environmentally friendly transport options such as submerged and depressed roads, comprehensive pedestrian network, use of environmentally friendly public transport vehicles and rail-based transport to NDAs and highly impacted, high density areas.
S	<i>Water Resources and Water Quality</i>	1. Conclude HATS waste water treatment schemes. 2. Action on marine shipping pollution and oil spills. 3. Increase sewerage charges to more fairly represent actual cost of sewage treatment and sewerage infrastructure. 4. Explore the feasibility of further increase in water charges to reduce water consumption and eliminate wasteful water practices. 5. Explore alternatives in terms of imported water resources, such as desalination and wastewater reuse. 6. Cooperate with Guangdong and Shenzhen Governments in tackling the trans-boundary pollution in Deep Bay and from the Pearl River. 7. Review the Water Quality Objectives to match the vision for a world city in Asia.
S	<i>Waste</i>	1. Advance consideration of waste incineration and waste-to-energy projects for ‘triple (waste reduction, CO ₂ reductions and energy productions) wins’.

Classification	Discipline	Possible Solutions/Mechanisms
		2. Introduce domestic waste charging schemes.
		3. Penalise failure to separate waste at source.
S	<i>Energy and Natural Resources</i>	1. Electricity grid interconnection physical implementation following consultancy study (see Q: Energy and Natural Resources. 1) findings.
		2. Establishment of Integrated Energy and Transportation Policy (refer to the UK's Energy Challenge report issued in July 2006).
		3. Increase targets for renewable energy use.
		4. Possibility of establishing area-wide district cooling for new reclamation areas or NDAs.
S	<i>Land Use and Landscape</i>	1. Establishment of "Conservation Area" and "Coastal Protection Area" on Outline Zoning Plans as "no-go" areas for development.
S	<i>Ecology</i>	1. Explore the establishment of a nature conservation trust.
		2. Explore the feasibility of Wetland Mitigation Banking.
S	<i>Others</i>	1. Incentives environmental technology sector, using the EcoPark model, to catalyse a vibrant sector and export capability of environmental products and services.
		2. Objective consideration of a centralized government agency that embraces economic, social and environmental considerations. Objective in-parallel, consideration of a more transparent and statutory Sustainability Assessment mechanism that, in tandem, can plan and assess the sustainability of future development options. Alternatively a sustainability assessment could be considered in-parallel with the statutory Environmental Impact Assessment process.
		3. Government to maintain 'rail' as the backbone transport policy and expedite railway development in urban areas.
L	<i>Air</i>	1. Cross-boundary cooperation in response to the air quality challenges arising from the burgeoning manufacturing and associated emissions north of the Hong Kong boundary in the PRD region.
		2. Consideration / establishment of Greater PRD Air Shed Management Authority to ensure holistic consideration and management of the region's air quality.
		3. Take the lead to work with the International Maritime Organisation to introduce low sulphur fuel content or MARPOL VI requirements for vessels entering the territory or emission control technologies for maritime industry.
		4. Government should give priority to environmentally friendly vehicles that meet EPD's specified qualifying standards for tax incentives when government vehicles are due for replacement, subject to operational requirements and the rational utilisation of resources. In the longer term (L) this could, for example, comprise replacement of certain hybrid vehicles in the HKSARG fleet with fuel cell- based vehicles.
		5. Consideration of wider use of Renewable Energy - solar, hydro, wave and geothermal power etc.
		6. Mandate the need for all marine vessels berthed in Hong Kong to use shoreside power and not on board power.

Classification	Discipline	Possible Solutions/Mechanisms
L	<i>Water Resources and Water Quality</i>	1. There should be continued programme for upgrading the treatment facilities in terms of capacity, and treatment level so as to cater for population growth, and any water quality needs.
L	<i>Energy and Natural Resources</i>	1. Explore the need for establishment of an “Energy Bureau”. 2. Consideration of wider use of renewable / nuclear energy.
L	<i>Cultural Heritage</i>	1. Advancement of NDA and adaptive re-use and integration of cultural resources in development options.
L	<i>Others</i>	1. Reconsideration of Port Rail Line or alternative haulage means for freight transportation based on updated forecast volume of goods.

E.7 SUSTAINABLE PROJECT MONITORING AND AUDITING AND FURTHER IMPLEMENTATION

- E.7.1 To ensure that the key potential impacts or benefits that have been identified are addressed at the correct stage of the future strategic development of Hong Kong, a process has been identified for capturing and following-up of any potential negative and positive environmental consequences and issues, termed Sustainable Project Monitoring and Audit (SPM&A), since it identifies strategic-level actions to facilitate the development of a preferred strategy project or component option in a sustainable manner.
- E.7.2 SPM&A, thus defined, identifies the key areas that should be addressed and investigated further, during the subsequent stages, in the development of the overall strategy to identify any strategic follow-up actions to facilitate environmentally beneficially development.

E.8 SUMMARY REMARKS

- E.8.1 On the strategic level, it is considered that the Preferred Development Option will not lead to any apparent deterioration in the environmental conditions of Hong Kong. In fact, it will result in an improvement in most aspects of the environment, but may have various cumulative environmental issues such as water, air quality, noise, sewerage infrastructure, ecology, visual impact, hazard, landscape and cultural heritage effects subject to the findings of further detailed studies in future. The location of the future container terminal, either in North West Lantau or South West Tsing Yi, is not found to have eminent difference from the strategic environmental assessment points of view.
- E.8.2 It is also considered that major proposals of the Preferred Development Option could help bring about positive effects on providing a better quality living environment to people in Hong Kong, which is one of the key planning directions of the HK2030 Study.
- E.8.3 The following summarises the environmental aspects which will have positive environmental outcomes.

Table E3 Summary of Environmental Aspects of Various Environmental Disciplines

Environmental Discipline	Environmental Aspects
Air Quality	<p>The spatial development pattern of housing and employment land has taken into account the concept of “jobs closer to home” thereby enabling reduction in work trips as well as traveling time.</p> <p>The transport network has incorporated the provision for additional railways in the short, medium and long-term, which is considered beneficial in improving the air quality (otherwise an increase in diesel-powered vehicles will further exacerbate the air pollution problem).</p> <p>Major NDAs in the New Territories are planned along railway lines (e.g. Hung Shui Kiu, Fanling North, Kwu Tung North) as these are more environmentally friendly than road-based transport modes.</p> <p>Development of new areas allows the incorporation of environmentally friendly transport options, such as comprehensively planned pedestrian network, use of environmentally friendly public transport vehicles, etc., which can ensure better air quality for the communities concerned.</p> <p>MARPOL VI requirements and shore-side power supply for marine vessels should be explored.</p> <p>More stringent vehicle emission controls should be considered.</p>
Noise	<p>Similar to the air quality aspect above, the environmental considerations could also improve the noise environment.</p>
Water Quality	<p>While further port development would require reclamation, the extent of new reclamations will be limited to the scale required to accommodate essential infrastructure or other uses expected to generate an over-riding improvement to the economy, functioning of the area concerned or quality of life.</p>

Environmental Discipline	Environmental Aspects
Waste	Construction/maintenance dredging of the container terminal will continue to reduce the capacity of the mud disposal areas, more for the North West Lantau container terminal option and less so for the South West Tsing Yi container terminal option under the Reference Scenario, unless an alternative use for the dredged mud could be found.
Hazard	Reduction of existing proposed population in the PHI consultation zones is of benefit in terms of societal risks.
Ecology	Ecologically important areas in Hong Kong will be protected and avoided. Considering the significance in conservation value, no major developments have been proposed at the rural parts of Sai Kung and Lantau under the HK2030 strategy.
Energy and Natural Resources	NDAs provide an opportunity to incorporate environmentally friendly initiatives, such as District Cooling Systems for Seawater Air-conditioning and utilization of solar energy. Reduction in work trips and traveling distances also helps to save energy.
Cultural Heritage	Development of NDAs in the Northern New Territories will improve the accessibility to certain sites with cultural heritage significance; hence providing incentives for enhancement of these sites which may otherwise be just left “unattended”.
Landscape and Visual	Development of NDAs in the Northern New Territories will provide an opportunity to “tidy up” the scattered port backup and open storage sites and relocate them to properly designed designated areas. Planning of NDAs should take full account of landscape and visual concerns.

E.8.4 Nevertheless, it should be noted that the above findings and recommendations are based on broad-brush strategic environmental assessments on various aspects of the Preferred Development Option as well as the “What If” Scenario for sensitivity test. It is likely that there may still be cumulative on-site and off-site impacts due to the development of the NDAs in terms of drainage, sewerage, air quality, noise and ecology, etc. The cumulative impacts of the proposed new container terminal, especially if it is to be located in North West Lantau, with other committed projects, like the HZMB or the construction of the third airport runway might need to be carefully examined in the future. Further studies and detailed environmental assessments on the proposed developments will need to be conducted to ensure their environmental acceptability and identify mitigation measures, where appropriate, during the implementation stage.

**ANNEX AN EXPLANATION OF THE REFERENCE SCENARIO AND “WHAT IF”
 SCENARIO UNDER THE HK2030 STUDY**

Reference Scenario

The following is a summary of major planning parameters and development proposals, assumptions on key infrastructure facilities, road network and rail projects assumed under the Reference Scenario of the HK2030 Study:

I. Population and Employment

	Base Year (2003)	2010	2020	2030
Resident Population	6.8	7.2	7.8	8.4
Employment	3.0	3.5	3.7	4.0

(in million)

Note:

Assumes population will grow at a slower rate of about 0.7% per annum.

A steady rate of economic growth (annual GDP growth at 4.0% initially and gradually falling to 3.0%) is assumed.

II. Housing Land Requirement

	Base Year (2003)	2010	2020	2030
Housing Stock	2,394	2,642	2,948	3,319
Accumulative Requirement	-	248	553	924

(in thousand units)

Note:

In the period between 2003 and 2030, a total requirement of about 924,000 units (averaging 34,000 per year) is assumed.

III. Economic Land Requirement

	Base Year (2003)	2010	2020	2030	Demand 2003 – 30	Req't 2003 – 30
CBD Grade A Offices	4.1	5.1	5.8	6.7	2.6	2.7
General Business	33.0	35.5	36.2	38.2	5.2	5.4
Special Industries	4.0	5.5	6.0	6.7	2.7	2.9
Total	41.1	46.2	47.9	51.6	10.5	11.0

(GFA in million m²)

Note:

‘General Business’ land use covers private offices (excluding CBD Grade A offices), industrial / office uses, flatted factories and private storages.

‘Special Industrial Uses’ involve high value-added, high-tech production and logistics activities such as industrial estates, science park and Cyberport, etc.

The floorspace requirement takes into account the existing surplus stock and the need to accommodate a ‘natural vacancy’ factor, a level of vacancy even under a normal healthy market situation.

IV. Strategic Infrastructure

Port Development

Our assumptions for future container throughput and terminal capacities are as follows:

	Base Year (2003)	2010	2020	2030
Container Throughput	12.8	18.0	28.8	34.5
Terminal Capacity				
CT 1 – 8, CT9 (part)	13.1	-	-	-
CT 1 – 9	-	19.8	21.7	23.0
CT 10	-	-	7.2	11.6
Total	13.1	19.8	28.9	34.6

(in million TEUs)

Source: HKP2020 Study.

Note:

The maximum capacity of the existing container port (CT 1 to 9) is around 18.6 million TEUs, with a potential for further increase by 1.7 million TEUs, and possibly more if additional land and other productivity measures are introduced. If the projected demand is realized, there is likely to be a need for a new container terminal (CT 10) in the first half of the next decade.

To determine the optimum location for the new terminal, two locations, namely North West Lantau and South West Tsing Yi, have been examined under the Study on Hong Kong Port – Master Plan 2020 (HKP2020 Study). Whilst a decision on the preferred location for the new terminal is pending further assessment including the findings of the Ecological, Fisheries and Water Quality Impact Assessment Study for the proposed container terminal development at North West Lantau, the HK2030 Study has taken into account both possible container terminal locations in the Reference Scenario for the purpose of assessment.

Port Back-Up (PBU) Land

The current supply of PBU land is 378 ha in 2003. The HKP2020 Study predicts that the total demand for PBU land will increase with port throughput but the trend for these uses to move over the boundary near the cargo centres in the PRD is expected to continue. If the projected demand of PBU land is to be realized, we would need to identify additional land to address this demand.

	Base Year (2003)	2010	2020	2030
PBU Land				
Demand	260	204	309	398
Supply	378	-	-	-
Known sources	-	439	480	500

(in hectares)

Source: HKP2020 Study and Planning Department's Estimation.

Airport

In 2005, the Hong Kong International Airport (HKIA) provided services to 40.7 million passengers and handled 3.4 million tonnes of cargo. The Airport Authority Hong Kong has recently published an update of the Airport Master Plan (known as the HKIA 2025) to guide

the future development of the HKIA up to 2025. It has projected that by 2025, HKIA will serve 80 million passengers, handle 8 million tones of cargo and 490,000 aircraft movements each year.

Although it has proposed studies on the feasibility for the construction of a third runway at the HKIA, this proposal has not been taken on board under the Preferred Development Option formulated on the basis of the Reference Scenario for assessment or the “What If” Scenario for sensitivity testing for the purpose of the HK2030 SEA in the absence of any details on this proposal at this stage.

V. Strategic Road Network and Railways

List of Committed and Assumed Major Transport Projects

(i) Railway Projects

By 2010 (committed in addition to existing rail network) <ul style="list-style-type: none">● Tseung Kwan O South Station● Kowloon Southern Link● Sheung Shui to Lok Ma Chau Spur Line
By 2020 (in addition to 2010 network) <ul style="list-style-type: none">● Shatin to Central Link● Kwun Tong Line Extension● Northern Link● Hong Kong Section of the Guangzhou-Shenzhen-Hong Kong Express Rail Link● West Island Line● South Island Line (East)
By 2030 (in addition to 2020 network) <ul style="list-style-type: none">● North Hong Kong Island Line● South Island Line (West)

(ii) Major Road Projects

By 2010 (committed in addition to existing network)
<i>New Territories</i> <ul style="list-style-type: none">● Route 8 (Shatin to Tsing Yi)● Castle Peak Road Widening (Tsuen Wan Area 2 to Siu Lam)
<i>Cross Boundary</i> <ul style="list-style-type: none">● Hong Kong – Shenzhen Western Corridor● Deep Bay Link

By 2020 (in addition to 2010 network)

Hong Kong

- Central – Wan Chai Bypass
- Island Eastern Corridor Improvement (Causeway Bay – North Point)

Kowloon

- Gascoigne Road Flyover widening
- Central Kowloon Route
- Trunk Road T2 (Kai Tak – Cha Kwo Ling)

New Territories

- Tolo Highway / Fanling Highway widening (Island House Interchange – Fanling)
- Tseung Kwan O – Lam Tin Tunnel
- Cross Bay Link at Tseung Kwan O
- Hiram’s Highway Dualling (Clearwater Bay Road – Sai Kung Town)
- Lantau Road P1 (Tung Chung – Sunny Bay)
- *Strategic North-South Link between NWNT and North Lantau

Cross Boundary

- ^ Hong Kong-Zhuhai-Macao Bridge (HZMB)
- HZMB’s North Lantau Highway Connection

By 2030 (in addition to 2020 network)

Hong Kong

- The Fourth Harbour Crossing
- Route 4 (Kennedy Town – Aberdeen) as an alternative to South Island Line (West)

New Territories

- Eastern Highway (NENT to Kowloon)
- Tsing Yi Lantau Link - with Coastal road and Chok Ko Wan Link Road (Pa Tau Kwu Section)

Notes:

1. ***The Strategic North-South Link between NWNT and North Lantau** stands for the possible alternative options being considered in the NWNT Traffic and Infrastructure Review, which cover candidate projects of Lam Tei Tunnel, Tai Lam Chung Tunnel, Tsing Lung Bridge, Tuen Mun Western Bypass, Tuen Mun-Chek Lap Kok Link, Tuen Mun Eastern Bypass, and Link Options between Tuen Mun and Lantau.
2. It should be noted that projects assumed are purely postulates for strategic transport assessments of the development scenarios under the Study. The need, scope and timing of each of the assumed transport projects would be subject to further review.
3. ^ The Governments of Guangdong, Hong Kong and Macao have commissioned a consultant to conduct a study on the locations and arrangements of the Boundary Crossing Facilities (BCF) under the mode of “Separate Location of BCF” for the HZMB.
4. The proposed Liantang / Heung Yuen Wai control point and the connection to the

Shenzhen Eastern Corridor, which is subject to further studies, has not been included in the preferred option for assessment.

VI. Demand for Cross-Boundary Road Traffic

Under the Reference Scenario, the daily cross-boundary (two-way) vehicle traffic on a normal weekday is assumed as follows:

	Car	Bus / Coach	Total
Base Year (2003)	8,200	3,600	11,800
2010	34,900	4,800	39,700
2020	63,000	9,400	72,400
2030	96,400	12,900	109,300

	Goods Vehicle	Container Truck	Total
Base Year (2003)	14,800	12,800	27,600
2010	24,400	23,100	47,500
2020	35,000	35,400	70,400
2030	39,400	39,900	79,300

VII. Other Strategic Infrastructure

Waste Management	<ul style="list-style-type: none"> The capacity of solid waste handling facilities could be enhanced by extension of existing landfills and planning of new landfills as well as development of integrated waste management facilities and the EcoPark.
Sewage Treatment	<ul style="list-style-type: none"> Remaining stages of the HATS and sewerage master plan reviews will be completed before 2020.
Power Supply	<ul style="list-style-type: none"> Gradual change from coal to gas power generation, supplemented by other forms of renewable energy such as wind power, solar energy (no major land implications) etc.
Water Supply / Treatment	<ul style="list-style-type: none"> Dongjiang water will remain as one of the major sources of raw water and the supply quantity should be commensurate with the demand. Desalination is one of the possible alternative water sources. Coastal site for such installation may be required subject to further study. A feasibility study on the engineering strategy for the Total Water Management in Hong Kong is being conducted which will map out the long-term strategy on the distribution of water supply from various sources for meeting the water demand.
Telecommunications	<ul style="list-style-type: none"> Extension of Teleport is envisaged to cater for long-term requirement.

VIII. Major Development Proposals / Projects

The following major development proposals are assumed to take place or completed within the study timeframe of the HK2030 Study:

Development Proposal
Central Reclamation III
Cyberport
Hong Kong Disneyland
Hong Kong International Airport Developments
Kai Tak Development
Lantau Concept Plan proposals

Development Proposal
Logistics Park at Siu Ho Wan
New Development Areas - Kwu Tung North, Fanling North & Ping Che / Ta Kwu Ling (Three-in-One Scheme) and Hung Shui Kiu
Ngong Ping 360
Ocean Park Redevelopment
Recovery Park in Tuen Mun
Science Park at Pak Shek Kok
Tseung Kwan O Further Development
Tung Chung Development
Urban renewal projects (various)
Wanchai Development II
West Kowloon Cultural District

“What If” Scenario

Under the HK2030 Study, we have developed a number of “What If” Scenarios by varying key planning parameters under the Reference Scenario. We have focused on the assumptions, which have direct and significant implications for the planning strategy and those that are more likely to happen in future, i.e. population and economic growth, and a set of Response Plans will be devised to respond to these alternative situations.

For the purpose of sensitivity testing under the HK2030 SEA, the scenario of high population growth and high economic growth (HPGS) with possible container terminal location at North West Lantau has been selected. The following is a summary of key development parameters and planning assumptions under this worst case scenario that are different from that of the Reference Scenario:

I. Population and Employment

	Base Year (2003)	2010	2020	2030
Resident Population	6.8	7.2	8.0	8.8
Employment	3.0	3.5	3.9	4.4

(in million)

Note:

It is assumed that the importation of more talent and professional workers to Hong Kong will make up a larger population, hence an additional increase of 0.4 million up to year 2030 than the Reference Scenario.

We have assumed a 0.5% GDP growth rate higher than that assumed under the Reference Scenario for the mid- and long-term (see table below).

	To 2010	2011 – 20	2021 – 30
GDP growth per annum (RS)	4.0%	3.5%	3.0%
GDP growth per annum (HPGS)	4.0%	4.0%	3.5%

II. Housing Land Requirement

	Cumulative Housing Requirement		
	2010	2020	2030
Reference Scenario	248	553	924
HPGS	248	626	1,129
Difference	-	+73	+205

(in thousand units)

Note:

Since the population assumptions under this scenario will only start to deviate from the trend of the Reference Scenario from 2020 onwards, divergence in cumulative housing requirement will start to arise in the similar timeframe. This implies that we need to explore opportunities for providing housing land for the additional of 205,000 units spread across 10 years, i.e. equivalent to around 20,000 units per year.

III. Economic Land Requirement

	Base Year (2003)	2010	2020	2030	Demand 2003 – 30	Req't 2003 – 30
CBD Grade A Offices	4.1	5.1	6.0	7.4	3.3	3.5
General Business	33.0	35.5	38.0	42.0	9.0	9.6
Special Industries	4.0	5.5	6.3	7.4	3.4	3.6
Total	41.1	46.2	55.7	56.8	15.7	16.7

(GFA in million m²)

Note:

As a result of the accelerated economic growth, the total economic land requirement will increase to 16.7 million m² GFA by 2030, representing an increase of 5.7 million m².

IV. Demand for Cross-Boundary Road Traffic

Under a higher level of economic activity, it may induce more cross-boundary traffic made by private cars for business or travelling purposes. We assume that there will be an additional of 13,800 daily vehicular trips made by private cars by 2030. For the same reason, there will also be a higher volume of cross-boundary traffic made by goods vehicles and container trucks. A comparison of the daily cross-boundary (two-way) vehicle traffic on a normal weekday is shown in the following tables:

	Car	Bus / Coach	Total
Base Year (2003)	8,200	3,600	11,800
2010	34,900	4,800	39,700
2020	70,400	9,600	80,000
2030	110,200	13,200	123,400

	Goods Vehicle	Container Truck	Total
Base Year (2003)	14,800	12,800	27,600
2010	24,400	23,100	47,500
2020	37,800	38,300	76,100
2030	42,400	43,000	85,400

FIGURES





