

Strategic Planning for Collaborative & Sustainable Development of Hong Kong & Shenzhen



F I N A L
R E P O R T

Prepared for URBP7004
Department of Urban
Planning and Design
The University of Hong Kong



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Executive Summary

Innovation and Technology (I&T) is regarded to be one of the key industries to strengthen the competitiveness and livability in cities. Shenzhen has been a pioneer in developing I&T industries in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA). With the rise of the regionalism, the competitive advantages of both cities can be maximized through the collaboration of the I&T development, as well as coping with the global trend of IT sector's growing importance.

Taking into account the literature review, international case studies, spatial strategies and policies in Shenzhen (SZ) and GBA, and the opportunities and challenges regarding the I&T sector and its strategic planning in Hong Kong (HK), HK should seize the opportunity to collaboratively develop its I&T sector with Shenzhen in order to gain sustainable benefits in its economy and society. This Study aims at recommending spatial planning strategy and policy for providing input towards the strategic planning paper of Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030 (HK2030+).

Considering the unique and prestigious positioning of HK in the Asian context and the window of China to the global market, HK should **strengthen its position as an international gateway by facilitating the regional collaboration with SZ and other cities in the GBA, as well as enhancing capacity for sustainable economic growth of the I&T sector.**

Derived from the three overarching planning principles, namely (1) allocating suitable land for forming I&T clusters to complete the production chain of I&T development within the HK boundary, (2) improving strategic transport network between the existing and potential I&T nodes in HK and SZ's key I&T related areas, and (3) ensuring effective and prompt deliveries of proposed conceptual spatial strategy through favorable policies. In response to these overarching planning principles, three development axes and four clusters (三軸四群) are formulated.

The four clusters are: Hung Shui Kiu /Yuen Long (HSK/YL) Cluster ; Lok Ma Chau /Kwu Tung North /San Tin (LMC/KTN/ST) Cluster; Ping Che/Ta Kwu Ling/Heung Yuen Wai (PC/HYW) Cluster; and West Kowloon/East Lantau Metropolis (WK/ELM) Cluster. The three belts/corridors are Northern Integrated Innovation Belt, Western Financial Innovation Corridor, and Eastern Knowledge and Technology Corridor.

Together with the strategic transport network and aspatial policies, the proposed spatial planning strategy can be effectively implemented. Priorities have been set to several spatial planning strategy, and phasing is suggested to divide the strategies for developing the I&T sector of Hong Kong from short to long term.

By grasping the opportunities and minimising the threats as identified, Hong Kong should make use of its established global market and sound legal system to increase the capacity for sustaining economic growth, hence promoting the status and competitiveness of Hong Kong in the global era.

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Abbreviations and Acronyms

Abbreviations and Acronyms	Phrase
AI	Artificial Intelligence
APAS	Automotive Parts and Accessory Systems R&D Centre
ASTRI	Hong Kong Applied Science and Technology Research Institute
BART	Bay Area Rapid Transit
BCP	Boundary control point
C&C	Cultural and Creative
CBD	Central Business District
CEDD	Civil Engineering and Development Department
CUHK	The Chinese University of Hong Kong
DevB	Development Bureau
DP	Development Plan
ELAt	Eindhoven-Leuven-Aachen Triangle
EU	European Union
FTZ	Free Trade Zone
GBA	Greater Bay Area
GDP	Gross Domestic Products
GFA	Gross Floor Area
GZ	Guangzhou
HK	Hong Kong
HK2030+	Hong Kong 2030+: Towards a Planning Vision and Strategy Transcending 2030
HKI	Hong Kong Island
HKIA	Hong Kong International Airport
HKRITA	Hong Kong Research Institute of Textiles and Apparel
HKSAR	Hong Kong Special Administrative Region
HKSTP	Hong Kong Science and Technology Park
HKSTPC	Hong Kong Science and Technology Parks Corporation
HKTDC	Hong Kong Trade Development Council
HKU	The University of Hong Kong
HSK	Hung Shui Kiu
HSR	High Speed Rail
HYW	Heung Yuen Wai
HZMB	Hong Kong-Zhuhai-Macao Bridge
I&T	Innovation and Technology
IoT	Internet of things
IBM	International Business Machines Corporation
ICA	Industrial Cluster Analysis
ICT	Information and Communications Technology
IEs	Industrial Estates
IMEC	Interuniversity Microelectronics Centre
IRP	Industrial Redevelopment Program
IT	Information Technology
ITB	Innovation and Technology Bureau
ITC	Innovation and Technology Commission
ITF	Innovation and Technology Fund
JTC	JTC Corporation

KTN	Kwu Tung North
LCSM	Logistics and Supply Chain MultiTech R&D Centre
LMCL	Lok Ma Chau Loop
LT	Liantang
MITRE	The MITRE Corporation
MKT	Man Kam To
MRT	Mass Rapid Transit
MSB	Multi-storey Building
MTR	Mass Transit Railway
NAMI	Nano and Advanced Materials Institute
NT	New Territories
NDA	New Development Area
NENT	Northeast New Territories
NTN	New Territories North
NUS	National University of Singapore
NWNT	Northwest New Territories
ODP	Outline Development Plan
OZP	Outline Zoning Plan
PlanD	Planning Department
PDA	Priority Development Area
PRD	Pearl River Delta
R&D	Research and Development
RIEC	Research, Innovation and Enterprise Council
SAR	Special Administrative Region
SMEs	Small and Medium Enterprises
ST	San Tin
SZ	Shenzhen
SZ MSU-BIT	Shenzhen Moscow State University – Beijing Institute of Technology University
THB	Transport and Housing Bureau
TKO	Tseung Kwan O
TM-CLKL	Tuen Mun/Chek Lap Kok Link
TNO	The Netherlands Organization for Applied Scientific Research
TPIE	Tai Po Industrial Estate
TST	Tsim Sha Tsui
TTR	Top Technology Region
TTR-ELAt	Top Technology Region/Eindhoven-Leuven-Aachen Triangle
US	United States
WC	Wang Chau
WK	West Kowloon
WKCD	West Kowloon Cultural District
YLIE	Yuen Long Industrial Estate
YLS	Yuen Long South

1. Introduction

1.1. Study Background

- 1.1.1. With the rise of new regionalism, cities around the world compete with each other in the form of city-regions, i.e. larger agglomeration formulated by several geographically proximate cities, in order to further strengthen their competitive edges. It is not uncommon for city-regions to develop beyond their administrative boundaries. Examples can be found in North America (San Francisco Bay Area), Europe (the Eindhoven-Leuven-Aachen Technology Triangle) and Asia (Singapore). Meanwhile, GBA is emerging as the most populous city-region in the world.
- 1.1.2. National strategic policies are set by the central government in favor of developing GBA into a globalized and dynamic city-region. Apart from the favorable government policies and their geographical location of the 9+2 cities, the comparative advantages of each city in the GBA have given rise to higher collaboration between cities. This new form of regional planning enables more opportunities to foster the development of different sectors, and to cope with challenges arisen from the intense global city-region competition.
- 1.1.3. In the regional context, collaboration among the cities in Pearl River Delta (PRD) has been legitimated as a national strategic planning for a decade. Since then, economic integration and cross-boundary infrastructure development between the nine cities and the two special administrative regions (SARs) have been actively promoted by the signing of agreements between the HKSAR and Macao SAR governments and Guangdong provincial government.
- 1.1.4. The official blueprint for the GBA was released in February 2019. The Outline Development Plan (ODP) for GBA reassured its positioning as a global influential international I&T hub and Hong Kong as an international financial centre, which facilitates the I&T sector development in the city-region. As highlighted in one of the policy areas for the development of the GBA, the governments in different GBA cities together share the vision of increasing efforts in boosting their I&T development.
- 1.1.5. “Asia’s World City” has been identified as the overarching planning vision of HK in the strategic planning paper of HK2030+. In order to enhance the competitive edge of Hong Kong on the foundation of sustainable development and the national strategic planning strategies, I&T sector needs to be further developed and supported among cities so as to collaboratively formulate corresponding spatial planning strategies in the regional dimension.
- 1.1.6. There are various reasons that support HK to further enhance its I&T sector. First, the economic risks of Hong Kong can be diversified. In the past, HK’s heavy reliance on the four pillar industries have exposed the city to adverse global economic fluctuation and financial risks. By diversifying Hong Kong’s income source to the I&T sector, the financial vulnerability can be reduced to secure wealth and growth in HK.

Besides, developing the I&T sector can help improve the liveability of citizens, especially the ageing population. There has been more technologies and resources spent on tackling the issue of ageing population, for instance, on medicine, smart living, Artificial Intelligence (AI), health science, etc. Investing on these industries within the I&T sector can thus improve the lives of the elderly as well as other households. Moreover, I&T sector can complement the growth of other sectors. Many sectors such as banking, education, medicine, logistics can be more efficient with the aid of I&T development.

1.2. Study Goal and Objectives

1.2.1. SKYLINE was appointed to carry out a study regarding the “Strategic Planning for Collaborative and Sustainable Development of Hong Kong and Shenzhen: HK2030+ Review”. The overarching goal of this Study is to formulate appropriate recommendations to provide input by updating and enriching our current strategic planning framework and strategy, in order to enhance the sustainable growth and development of Hong Kong.

1.2.2. This Study consists of three stages, namely:

- Contextual Study;
- Sectoral Studies and International Review; and
- Consolidation, Strategy Formulation and Recommendation.

1.2.3. Stage 1 and 2 have been accomplished in which the results comprised the basis of Stage 3. The following objectives are set to accomplish the study goal:

- Identify the key strategic planning issues of HK, specific to the development of I&T sector in the GBA context;
- Study the current literature to understand theoretically about regional and strategic planning, and I&T sector;
- Examine the implications of SZ on the strategic planning of HK in terms of the I&T sector;
- Understand the aspirations and requirements of relevant stakeholders about the regional planning of I&T sector in HK & SZ;
- Review international best practices for the development of the I&T sector and regional planning in Hong Kong;
- Provide vision and recommendations to provide input to the current framework in HK2030+.

1.3. Study Process and Methodology

1.3.1. The Study will be carried out in three stages. In Stage 1, a broad scope review of the strategic planning context in GBA, SZ and HK with a focus on regional planning and I&T development was conducted. The review has identified the key planning issues and opportunities in the two cities. In Stage 2, it has expanded upon the knowledge acquired in Stage 1 by conducting in-depth study into the collaborative development between HK and SZ through collecting stakeholder opinion, conducting district-

specific planning study of SZ and learning from international best practices. Stage 3 will consolidate the findings in Stage 1 and 2 then recommend a set of strategic planning policies in response to augment the existing territory-wide HK2030+ framework.

- 1.3.2. A careful selection of methods will be used to achieve the tasks in different stages. For a detailed organisation of each individual task in the three stages, please refer to the study flowchart in Figure 1.1.

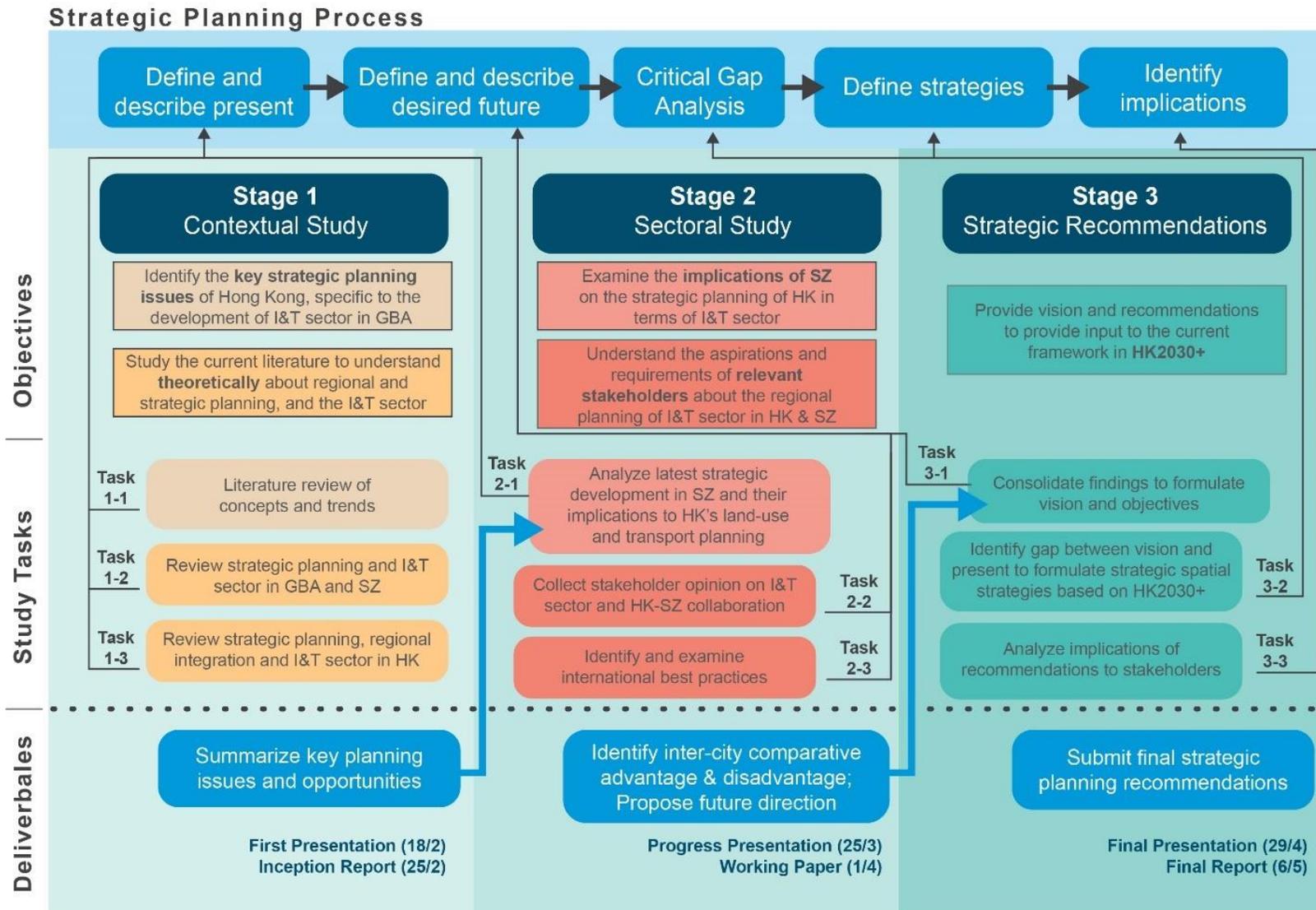


Figure 1.1 Study process

Source: Study Team

Stage 1 Contextual Study

- 1.3.3. Task 1-1 reviewed the relevant literature regarding several relevant concepts and trends through desktop research. The literature review consists of the intellectual explanation of the key concepts relevant for this study, namely the I&T sector, regional planning and competitive advantage, production chain, and agglomeration effect. Articles or documents from the academia, local and national government, as well as international organisations were reviewed.
- 1.3.4. Task 1-2 researched on the strategic planning and I&T development in the GBA and SZ. Existing government documents and relevant researches were examined to consolidate the vision, proposed infrastructure, policies and I&T development of the GBA. The evolution of strategic planning and the existing conditions of I&T sector in SZ were also reviewed.
- 1.3.5. Task 1-3 reviewed the strategic planning, regional integration and I&T in HK through desktop research, and Industrial Cluster Analysis. The desktop research focused on the latest strategic planning document in Hong Kong – HK2030+. Furthermore, the degree of integration in the I&T sector between HK and SZ, including their specialisation, resources, infrastructure and institutions/policies were summarised to determine corresponding I&T development strategies in HK complementary to SZ.

Stage 2 Sectoral Study

- 1.3.6. Task 2-1 analysed the latest strategic development in SZ and their implications to HK's land use and transport planning framework via Accessibility Analysis and field study. SKYLINE was responsible for assessing the Central region (Futian, Luohu, Longhua and Longgang Districts) of SZ. Two sub-consultancies, URBAN DNA and LAB, were appointed to carry out the assessment of the Western and Eastern regions of SZ respectively. The combined findings updated the collaborative planning strategies of HK with a detailed understanding of the entire SZ. Field trips and desktop research were conducted to identify the key strategic development in the Central region of SZ.
- 1.3.7. Task 2-2 collected stakeholders' opinions on I&T sector and HK-SZ collaboration through interviews and field study. Their inputs are the key to review the direction set in the three building blocks of HK2030+ to facilitate the growth of the I&T sector, and to ensure the proposed collaborative strategies are applicable and suitable to all relevant stakeholders. For further details, please refer to Appendix 6 for the gist of the interviewees.
- 1.3.8. Task 2-3 identified and examined three international best practices. The takeaways of the case studies are concerning (1) utilization of underutilized sites, (2) transport infrastructure and its surrounding land uses, and (3) integrated development model.

Stage 3 Strategic Recommendations

- 1.3.9. Task 3-1 consolidated the findings of Stages 1 and 2 to formulate the vision and objectives through SWOT Analysis of the current I&T development in HK. The strengths of Hong Kong that outweigh the other cities in GBA and the weaknesses of the I&T development Hong Kong were analysed. The opportunities and threats that Hong Kong may encounter from its external political and economic environment were also examined.
- 1.3.10. Task 3-2 identified the gap between the present and the proposed vision to formulate strategic alternatives to the HK2030+ framework by recommending strategic spatial strategies. Consolidating the SWOT Analysis in Task 3-1 with the existing HK2030+ strategic planning framework, planning principles and key actions were identified to accomplish the overarching vision. Four I&T clusters and three belts/corridors were demonstrated. Phasing from short to long term was thus applied to the recommended spatial strategy and supporting policies for increasing their feasibility in action.
- 1.3.11. Task 3-3 analyzed and examined planning implications to different stakeholders of the recommended inputs for HK.

1.4. Study Management

- 1.4.1. Figure 1.2 shows the staff organisation of the Study Team. Our Team has expertise in the fields of urban planning, infrastructure, environment, sustainability, economy, innovation technology, and policy.

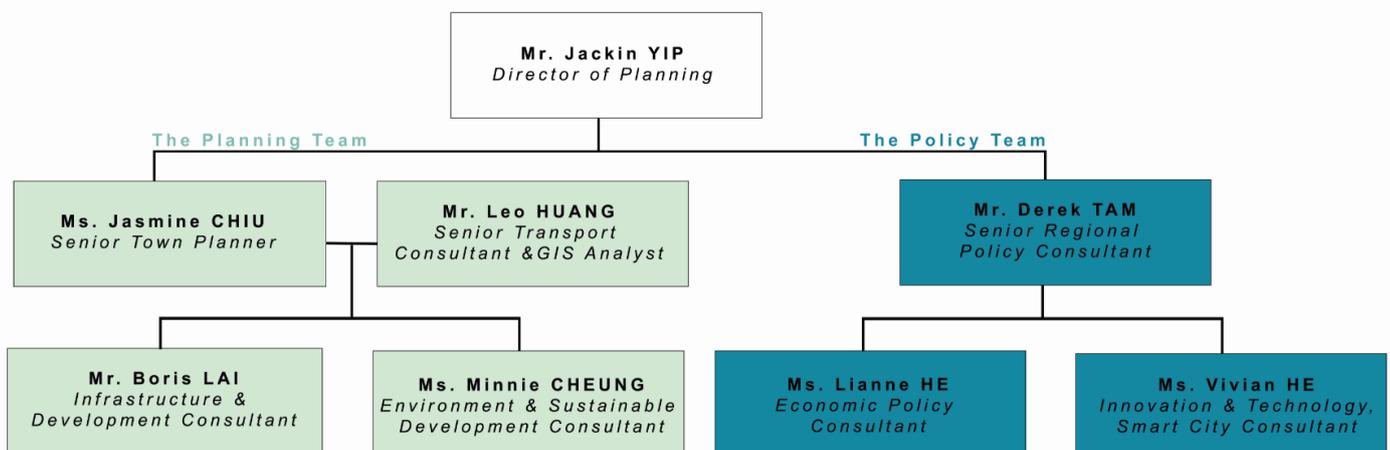


Figure 1.2 Staff organisation
Source: Study Team

- 1.4.2. Figure 1.3 shows the work programme of the past four-month consulting services.

Tasks		Duration (Weeks)	Week																
			21/1	28/1	4/2	11/2	18/2	25/2	4/3	11/3	18/3	25/3	1/4	8/4	15/4	22/4	29/4	6/5	13/5
Task No.	Stage 1		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1-1	Literature Review of Concepts	4	■	■	■	■													
1-2	Review of Strategic Plans in HK & SZ	4	■	■	■	■													
1-3	Examine present condition of I&T sector and HK-SZ socio-economic integration	4	■	■	■	■													
1-P	Preparation of Inception Report presentation	1				■													
	Presentation of Inception Report	-																	
1-R	Preparation of Inception Report	2	■	■	■	■	■												
	Submission of Inception Report	-																	
Stage 2																			
2-1	Analysis of land use and transport implications of latest strategic development of SZ to HK (Central Region)	4						■	■	■	■								
	Field Study to Central Region	1						■											
	*Analysis of Western Region							■	■	■	■								
	#Analysis of Eastern Region							■	■	■	■								
2-2	Collect stakeholder opinion with interview	4						■	■	■	■								
	Field Study to SZ Eco-Tech Park and Qianhai	1						■											
2-3	Case study for international best practices	4						■	■	■	■								
2-P	Preparation of Working Paper presentation	1									■								
	Presentation of Working Paper	-																	
2-R	Preparation of Working Paper	2						■	■	■	■								
	Submission of Working Paper	-																	
Stage 3																			
3-1	Consolidation of findings to formulate strategic plan vision and goals	1											■						
3-2	Formulation and prioritization of strategic alternatives	2											■	■					
3-3	Evaluation of planning implications and resource requirements of the prioritised alternative	1													■				
3-P	Preparation of Final Report presentation	1																	
	Presentation of Final Report	-																	
3-R	Preparation of Final Report presentation	2											■	■	■	■			
	Submission of Final Report	-																	
Public Presentation																			
PP-1	Preparation of public presentation materials	1																	■
PP-2	Delivery of public presentation	-																	

Figure 1.3 Work programme
Source: Study Team

1.5. Structure of the Report

- 1.5.1. This Final Report is organised into nine chapters, including the introduction chapter:
- Chapter 2 demonstrates the key concepts of I&T sector, regional planning and competitive advantage, production chain, and agglomeration effect from literature review;
 - Chapter 3 reviews relevant international best practices and summarizes the key takeaways and implications to Hong Kong;
 - Chapter 4 illustrates the strategic planning of Shenzhen (Central, Eastern and Western SZ) and highlights their overall implications to Hong Kong;
 - Chapter 5 gives an overview of the strategic planning in Hong Kong with a special focus on I&T sector, identifies some criteria for potential I&T nodes selection to serve as the foundation of Stage 3, elaborates the strengths, weaknesses, opportunities, threats of the I&T development of Hong Kong;
 - Chapter 6 develops a vision statement and planning principles;
 - Chapter 7 proposes the spatial strategies, strategic transport network, supporting policies with reference to the key actions, and discusses the possible implications to stakeholders;
 - Chapter 8 demonstrates the key evaluative considerations of phasing and proposes a conceptual action plan from short to long term;
 - Chapter 9 draws the concluding remarks with highlighted insights.

2. Literature review

2.1. Innovative and Technology (I&T) sector

- 2.1.1. I&T combines scientific knowledge, technological expertise, and creativity. “Innovation” can be explained by replacing old concepts or products with new ones by continuously updating and improving them, and “technology” is seen as a building block to be embodied into the concepts and products (Vaughan, 2013).
- 2.1.2. On a global scale, I&T development is increasingly influential in leading changes in the traditional industrial structure and the ways of living. The I&T development, hence, creates a new phase of social governance (Tan, 2018). First, the new industry of I&T, such as network technology, 3D printing, are emerging. Besides, the internet of things (IoT) refers to the network of different connected devices like home appliances, allowing cities like HK to become smarter by aggregating and normalizing information (Ibid.; Ismail, 2018). Due to the decentralization of the forms of communication and data collection, AI and robotic technology are being developed gradually, and are applied to facilitate the productivity and urban management in the age of big data (Harper, 2017).
- 2.1.3. I&T development has been increasingly incorporated into urban planning to encourage innovation and maximize profit by making technology infrastructure as the overarching theme in economic development. For instance, utilising such infrastructure to incubate favorable condition for economic development and policy formulation (Hackler, 2006). It is also one of the key features mentioned in the Sustainable Development Goals to achieve sustainable development by balancing the development needs of the social, economic and environmental aspects for both present and future generations (United Nations Assembly, 2005; 2015).
- 2.1.4. Table 2.1 showed the 3 types of capitals as the key driving forces on I&T (Huang & Fernández-Maldonado, 2016).

Table 2.1 3 types of capital as key driving forces of on I&T

Types of Capitals	Explanations
R&D	The generation of new knowledge for new products and services through improving the financial and entrepreneurial climate.
Relational	The ability to locate the needed resources and knowledge through formal or informal relations by fostering the networks between technology infrastructure concerned, external private companies, support systems and professional groups.
Human	The labor resources provided by the population, which can be enhanced by providing high quality public amenities and education systems.

Source: Huang & Fernández-Maldonado, 2016

- 2.1.5. To obtain these capitals in the region, governments should seek to collaborate with tertiary educational institutions and high-tech companies. The collaboration can allow access to know-how and resources concerning the newest development in the field. Collaboration can be achieved through incorporating new institutional arenas

to the decision-making process, providing high-tech spaces, and supplying land for knowledge-based production to encourage innovation (Huang, 2013). These insights can help evaluate the extent to which I&T development can be used to achieve sustainable development in HK.

2.2. Regional Planning & Competitive Advantage

- 2.2.1. 'City-region' is usually classified as a clearly defined administrative area, consisting of one or more urban area(s) with its surrounding terrain. The concept of city-region is increasingly concerned with the interaction between actors, such as local advocacy and civic organizations, and attempts to form meaningful relationships across physical and administrative boundaries to reap economic benefits alongside with other goals (Alagic, Boelens & Glaudemans, 2017).
- 2.2.2. In recent years, countries have increasingly adopted regional planning in solving complex postmodern metropolitan problems. Through delegating their power to new governance scales, such as city-regions, these problems can be solved more efficiently and at a lower cost (Cremer-Schulte, 2014; Wheeler, 2002). The focus for regional planning has also shifted from solely on transport planning to the incorporation of other dimensions such as economic development, housing, as well as natural resources (Tomas, 2018). With a spatial focus, these planning procedures are multi-dimensional and multi-objective (Hall & Tewdwr-Jones, 2010).
- 2.2.3. The growing attention towards regional planning has led to the rise of regional identity and importance of city-region on the global stage. With the growth in the number of players in the global economy, more city-regions have placed additional emphasis on creating and sustaining its competitive advantage globally by localized processes such as innovation fostering (Bromley, 2001; Mikkonen, 2002). Adopting the regional planning governance structure can act as a catalyst for a conducive business environment, and subsequent technical and knowledge spillovers from innovation. These processes can eventually benefit the peripheral areas in the later stages (Li & Li, 2018). During the planning process, the operational logic of the individual cities within the regions (e.g. HK and SZ) should also be mutually understood by each other during the planning process, with their differences highlighted rather than discounted (Jacobs, 2016).
- 2.2.4. Competitiveness of city-regions, as pointed out by Porter (1990), can be analyzed with one single industry rather than the entire economy. It is crucial for regions to understand their competitive advantages, and maximize them with a forward-looking and sustainable manner. This can be explained with the "diamond of competitive advantage" (Table 2.2), in which four interrelated conditions were suggested (Figure 2.1).

Table 2.2 Definitions of four interrelated conditions

Determinants	Explanations
Factor conditions	Fundamental physical factors of national production, for instance, land, capital, labor, infrastructures etc., which are necessary for the competitive advantage in an industry.
Demand conditions	Home-demand for a certain product or service will create an early picture of growing customers' needs, which is favorable to the development of an industry by having it well-prepared for future trends and innovating new competitive advantages.
Related & supporting industries	Domestic related industries which are competitive in the globe will stimulate and support the innovation of new competitive advantages.
Firm strategy, structure, rivalry	Governance in domestic rivals, which will determine whether it is a constructive or destructive competition, yet, domestic rival, is powerful in motivating the creation of new competitive advantages.

Source: Porter, 1990

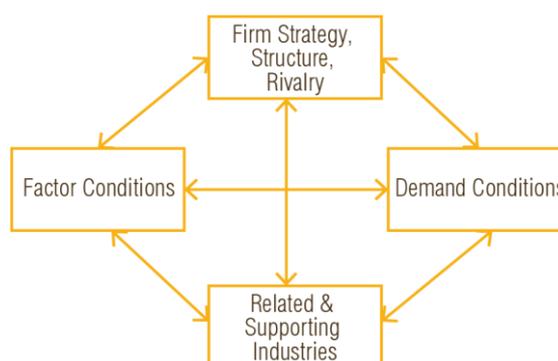


Figure 2.1 Diamond of competitive advantage

Source: Porter, 1990

- 2.2.5. Regional planning can contribute to maximize the competitive advantages of multiple cities. Among the interrelated determinants, “factor conditions” will be the priority to this study, as they are the supporting determinants to strategic and regional planning. They determine the allocation of resources such as land resources, infrastructure, and transportation system. The other three determinants, on the other hand, will play a role in creating the ecosystem for I&T development through producing synergy with the other sectors, such as public intervention and R&D input from other private entities.
- 2.2.6. While the government cannot create a competitive advantage itself, it can still act as the catalyst in promoting the elements in the diamond structure. This can be done through forming conducive business environment to stimulate innovation from businesses, and promote clustering of competitive advantages, such as policy-making, legal, and strategic planning. According to Porter (1990), creating clusters of industry, business in the clusters will eventually be mutually supporting each other, resulting in a win-win situation.

- 2.2.7. This diamond has shed important insights to the strategic and regional development of Hong Kong, including:
- **Priorities for strategic planning:** As factor conditions are the fundamental elements of supporting industries' competitive advantage, strategies for land and transport infrastructures, should be placed at a higher priority, as to stimulate I&T development and integration by expanding the market based on demand locally and from GBA.
 - **Industrial integration:** I&T integration will help open up a larger market, i.e. Demand conditions, which facilitates further development in I&T sector in HK.
 - **Benefit from regional integration:** Grasping the opportunity to collaborate and taking a more holistic planning approach in city-region scale, HK-SZ Governments will be able to resolve the unsolvable complex socio-economic issues collectively.

2.3. Agglomeration Effect

- 2.3.1. Industrial agglomeration can be further divided into localization economies (agglomeration within a single sector) and urbanization economies (agglomeration across multiple sectors) (van Oort, 2011). While the phenomenon has been of interest to economists since the late nineteenth century, agglomeration has played a more important role to economic development in the recent years (McCann, 2008). This is because as the transportation and communication technology advance, decision makers concentrated at a single agglomeration can better manage the economic activities in a larger geographical area, and the role for clusters as the regional economic coordinator is strengthened significantly. Furthermore, with more complex information involved in the knowledge economy, an efficient flow and management of information through face-to-face interaction has become crucial in economic development, making it more important for the agglomeration of different stakeholders within close geographical proximity.
- 2.3.2. Other than promoting the global economic development in the broader scope, the formation of industrial clusters will also lead to different positive externalities benefitting individual companies (Gallagher, 2007). For clusters with completed production chain, they will form what is known as the first-degree linkages and enjoy the benefits of lower transportation cost in product delivery. In other cases, clusters can be made up of companies with similar nature. While the need of product delivery among firms is minimized, second-degree linkages can still be observed between these companies with the spread of sector-specific knowledge. Specifically, four positive externalities due to the said industrial agglomeration (Table 2.3) can still be enjoyed by the firms from both the supply and demand perspectives.

Table 2.3 Positive externalities for second-degree industrial agglomeration

Positive Externalities	Explanations
Specialized Labor (Supply Side)	A specialized labor pool will be formed when more labor with related skills are attracted by the job opportunities provided by the agglomeration of similar firms, reducing the transaction costs of hiring and searching for firms.
Specialized Non-Labor Inputs (Supply Side)	Agglomeration can attract specialized suppliers that can intensify industries-specific inputs with higher efficiency and lower cost, as suppliers can obtain a quicker return on their investment through the economics of scale.
Knowledge Spillover (Supply Side)	There are more opportunities to acquire knowledge from each other through formal and informal methods of communication, for example, business meetings and alliances. It is also easier for companies to share the expertise from the employees, facilitating the transfer of tacit knowledge.
Heightened Demand (Demand Side)	Agglomeration of companies with similar products can attract more customers through two ways: lowering the search cost of customers for the best deal, and providing legitimacy to companies for the quality of their products or services.

Source: Woo, 2016

- 2.3.3. The effects of supply-side externalities are more significant for manufacturing and R&D intensive sectors, such as I&T industries. This is because supply-side externalities can boost the innovative capacity of the companies involved and lower the production cost. On the other hand, demand-side externalities are more crucial for service-related industries with a stronger emphasis put upon the end users and customers.
- 2.3.4. The effects of these externalities will also be heterogeneous to different firms within the agglomeration. Due to the extensive amount of resources owned, large companies within the agglomeration are more likely to be the providers of positive externalities. On the other hand, smaller companies are usually the beneficiaries since their development is more reliant on external information and technology. This will bode well for innovation in startups since they can utilize these externalities as part of the input and compensate for their lack of scale and risk-bearing capacity (Woo, 2016).

2.4. Production Chain

- 2.4.1. Production chain is considered as an important system for I&T products. Based on the production chain shown in Figure 2.2, cities should be able to identify their own competitive advantages and weaknesses so as to formulate appropriate strategic planning schemes.

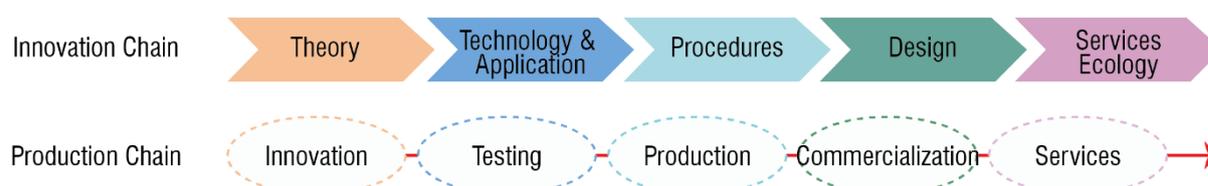


Figure 2.2 I&T production chain

Source: Study Team

- 2.4.2. In terms of production, there are 5 stages involved.
- **Innovation:** R&D works which are done by researchers, or start-ups;
 - **Testing:** hardware, space for testing products and software;
 - **Production:** manufacturing process and mass production of I&T products;
 - **Commercialization:** product design and marketing of I&T products;
 - **Services:** connection with customers to sell out the I&T products.
- 2.4.3. In this study, the production chain is used as the foundation for land use and transport planning, as well as encouraging collaboration with adjacent cities.

2.5. Relationship between Regional Planning and I&T Sector

- 2.5.1. Regional planning and I&T sector are interrelated in the sense that I&T creates alternative platforms for communication and collaboration between cities, hence enhances cross-boundary cooperation. All stages of knowledge of production: creation, storage, sharing of knowledge, are further enhanced through the application of I&T (Prasad et al., 2013). In return, regional planning provides platforms for cooperation in developing I&T infrastructure, which enables cities to leverage their competitive advantages and roles as industrial agglomerations.
- 2.5.2. As mentioned in 2.2, the focus of regional planning has been transforming in multi-dimensions, and has shifted towards the pursuit of sustainable development at inter-governmental level. The development of I&T sector is an effective measure to achieve sustainability and livability among different city-regions.
- 2.5.3. The strategic planning at the regional scale of GBA emphasizes the development of the I&T sector, in order to enhance regional development. It supports the I&T sector spatially through land use allocation and politically through policies. The central government increases opportunities of collaboration and cooperation for developing I&T sector between HK and SZ. As HK and SZ specialize in different scopes of I&T, their collaboration will enhance the efficiency of the I&T production chain, and to a larger extent, promote sustainability at the regional scale.

Table 2.4 Comparison between existing I&T environment in HK and SZ

Indicators	Hong Kong	Shenzhen
Scope of technology	Upper scope University-led	Middle-lower scope Industry-led
Field	Biotechnology Artificial Intelligence Smart City FinTech	Biology Internet New energy/ materials Next generation I&T Energy saving and environmental protection
Contribution to GDP	2016: \$17,072 M 0.7% in GDP	7 emerging industries 40% in GDP in 2016

Source: Mok, 2016; Hong Kong Trade Development Council, 2018; Onag, 2016; Ho, 2018; Hong Kong Financial Services Development Council, 2017; Wong, 2014; Shenzhen Innovation and Technology Committee, 2017; Invest Shenzhen, 2017

- 2.5.4. Thus, strategic planning for I&T land uses arises as an important issue to be dealt with by the Hong Kong government to facilitate the city's growth. The latter part of this report will therefore reflect how Hong Kong should learn from the global trend of I&T sector, and incorporate the development of technological infrastructure into future spatial planning strategies. Understanding the key driving forces can help better formulate the strategic planning policies to support future I&T and sustainable development in HK.

3. International Case Studies

3.1. Cases Selection

- 3.1.1. As one of the study objectives is to recommend appropriate spatial planning strategy and policy in the light of collaborative development of the I&T sector in HK and SZ, three international cases in Europe, Asia and America were chosen for further investigation. They were examined in terms of policy intervention, strategic land use and transport network, and integrated development model. These three aspects can together deepen understanding in collaborative and strategic planning of city-region. The three chosen cases are in the following three geographical levels: the Top Technology Region/Eindhoven-Leuven-Aachen Triangle (TTR-ELAt)(Europe) at the transnational level; Singapore (Asia) at the national level; and San Francisco Bay Area (Bay Area)(America) at the regional level.

3.2. Overview of International Cases

Top Technology Region/Eindhoven-Leuven-Aachen Triangle (TTR-ELAt)

- 3.2.1. TTR-ELAt is one of the most competitive technological regions in the European Union (EU) (Figure 3.1). It consists of six regions located at the borders of Germany (Flemish Brabant, Liège, and Cologne regions), the Netherlands (Provinces of North Brabant and Limburg) and Belgium (Limburg region). The city-region accommodates a population of 8 million and had a GDP of US\$384 billion in 2013. The city-region operates in the form of agglomerating multiple medium-sized cities (Eindhoven, Leuven, Aachen, Liège, Maastricht and Hasselt), which are closely linked both internally and with the major urban centres of the three countries. The specialism of TTR-ELAt is on chemical and advanced materials, high-tech system, and health science, as illustrated by the fact that the number of average patent application of the region on high-tech systems is the highest among all regions in Europe (Nauwelaers, Maguire & Marsan, 2013).



Figure 3.1 Location Map of TTR-ELAt
Source: Nauwelaers, Maguire & Marsan, 2013

- 3.2.2. TTR-ELAt was formed by the integration of two initiatives: the Top Technology Region (TTR) and Eindhoven-Leuven-Aachen Triangle (ELAt) in 2009. While the two initiatives were officially launched in 2004, project-based cooperation among the regions could be traced back to the effort of the creation of Euregio Meuse-Rhine, which was one of the first cross-border cooperation agreements in the 1970s. With a vision of fostering a technology hotspot in the region using a bottom-up approach, TTR-ELAt can provide reference to HK as in the ways to facilitate the collaboration between regions with complementary strengths.

Singapore

- 3.2.3. In recent years, Singapore has become one of the the top technology hubs in the world. Due to the rise of the Asian market, it has also become one of the hotspots for western I&T companies to set up their Asian headquarters. Singapore has a population of 5.64 million and a GDP of US\$324 billion. With its mature I&T ecosystem, Singapore accommodates 80 of the world's top 100 technology firms. According to the Bloomberg Innovation Index, Singapore ranked sixth in the world in terms of innovation, and was the first in Asia (Capri, 2018).
- 3.2.4. Singapore is a fast-growing country with a relatively short history. After gaining its independence in 1965, Singapore functioned as a manufacturing port for export. Since the 1980s, the Singaporean government decided to diversify its growth strategy into a knowledge-based economy through focusing on innovation and entrepreneurship. After decades of effort, there is a rapid increase in Singapore's

technological capability. Singapore also has a strong tertiary education that is recognized internationally, the National University of Singapore (NUS) ranked the highest at 12th, with more than 7,800 PhDs being trained locally by the universities (Research, Innovation and Enterprise Secretariat, 2016). Currently, Singapore is focusing on developing four technology domains: advanced manufacturing and engineering, health and biomedical sciences, urban solutions and sustainability, and services and digital economy. With a similar context, it is hoped that the case study of Singapore can provide insights on government-led initiatives to develop the I&T industry.

San Francisco Bay Area

- 3.2.5. The Bay Area is often being regarded as the America's foremost technological hub with the success of the triple helix development model. Situating in the West Coast of the California state in the United States (US), the Bay Area consists of nine counties with a population of 7.7 million. The Bay Area has become the second largest concentration of Fortune 500 companies in the United States, including Google, Apple Inc., Intel, eBay, Netflix, Sony Interactive Entertainment, and more. The San Francisco Bay Area contains three principal cities that attract different types of employment clusters: San Francisco is the financial, business and tourism center; Oakland as the industrial and shipping center; while Silicon Valley has gained its worldwide reputation on technology industry and its corresponding economic activities. With the GDP of US\$781 billion in 2016, the Bay Area ranked 6th among all states in the US. It also has a higher GDP than the country of Saudi Arabia and Turkey. From these statistical evidences, the Bay Area is widely regarded as being extremely successful in fostering economic development and technological advancement.
- 3.2.6. Silicon Valley has been evolving into a large cluster of high-technology companies in the US since the opening of Shockley Semiconductor Laboratory, the first high technology corporation, in the 50s. The regional innovation strategy of university-industry-government (academically known as the triple helix model) contributed as one of the crucial factors that led to its success (Etzkowitz, 2012). With similar population size, the presence of quality higher education institutes, and the proximity of universities and high-tech industries, i.e. Stanford University to Silicon Valley, and the University of Hong Kong (HKU) and the Chinese University of Hong Kong (CUHK) to the existing Cyberport and HKSTP respectively, it supports that the future development of I&T cluster in HK can also learn from the triple helix cluster of the Bay Area.
- 3.2.7. The Bay Area has been on a supreme status for fostering tech talents. According to the Tech Talent in North America Report by CBRE in 2018, San Francisco Bay Area reigned as the best location for tech talents in North America despite the high costs of living and office rents. With a total number of over 320,000 tech talents working in the Bay Area, tech companies continue to expand and attract tech talents.
- 3.2.8. Bay Area Rapid Transit (BART), constructed and operated since 1972, is the rapid transit and commuter and light rail transit serving the Bay Area (Figure 3.2). Connecting the counties of San Francisco, Alameda, Contra Costa, and San Mateo, the 112-mile long rapid transit system has an a daily ridership of more than 400,000 passengers on weekdays. In 2018, the San Francisco Bay Area Rapid Transit District

has proposed the expansion of BART to San Jose which will connect Silicon Valley with the other counties served by BART. This proves the importance of the importance of strategic transport networks in supporting the success of the I&T hubs.

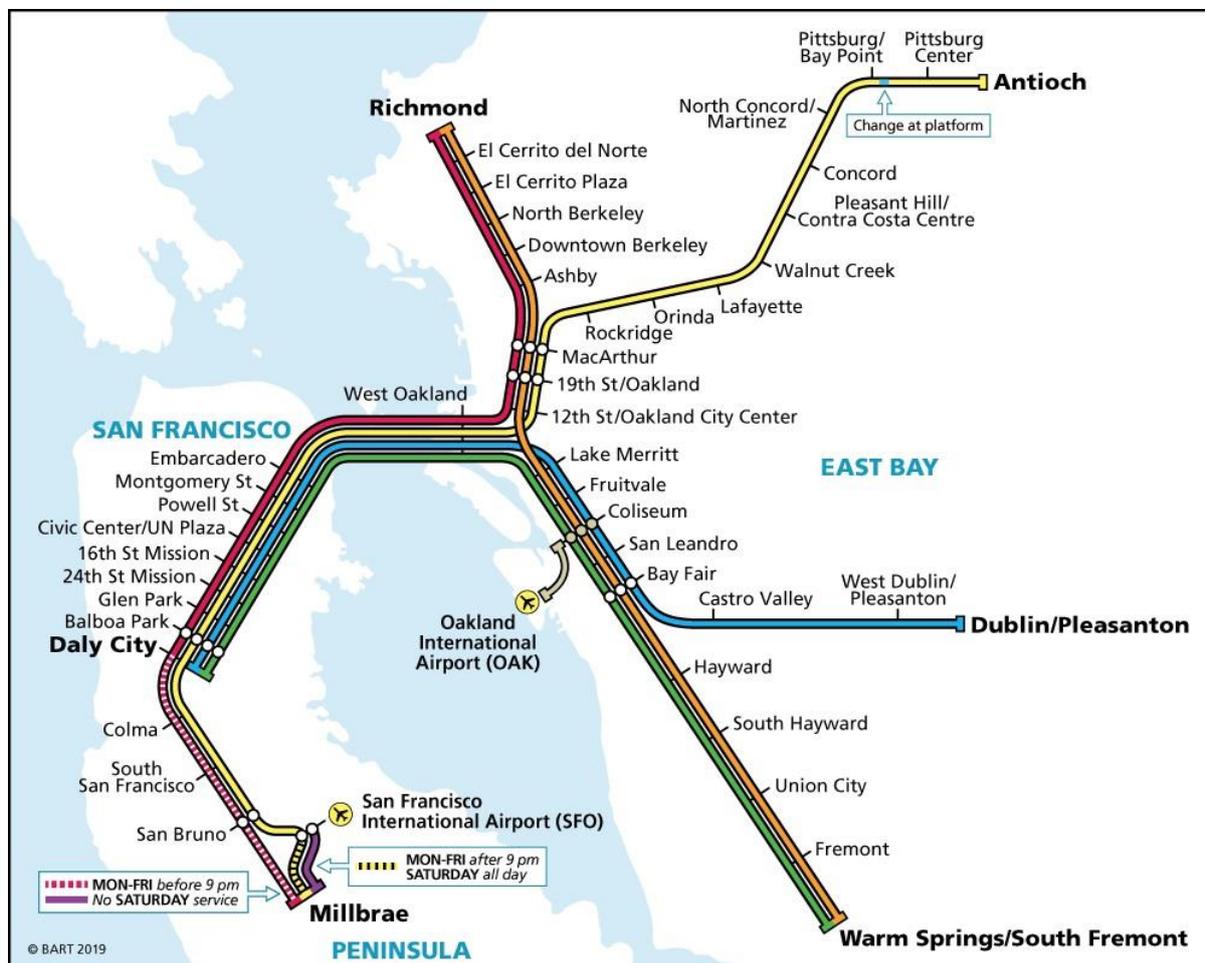


Figure 3.2 System Map of BART
Source: Bay Area Rapid Transit, 2019

3.3. Key Takeaways and Implications to HK

Utilization of Underutilized Sites

Top Technology Region/ Eindhoven-Leuven-Aachen Triangle

- 3.3.1. The utilization of underused land in the TTR-ELAt can be observed through the case of Strijp-S. Located in Eindhoven, Strijp-S was the first industrial park that Philips was first developed in 1916. There was a self-sufficient manufacturing line for Philips from raw material to end products, hiring more than 10,000 people. In 2004, the site was sold by the company and the area was then redeveloped.
- 3.3.2. Since Strijp-S is located at the Brainport region in Eindhoven, the most important I&T region in the Netherlands with focus on high-tech system, the redevelopment process was aimed to integrate the area with the current technological cluster. Research and development (R&D) spaces are provided in Strijp-S for multinational

corporations, such as Bosch and Manus VR, as well as local technological companies and start-up firms. The local and start-up firms include Addictive Industries and Effect Photonics. Knowledge institutions such as Singularity University also transfer some scientific breakthroughs to the commercial sector. Other than the ecosystem of innovation, other types of facilities are also present in the comprehensive redevelopment of the site. Spaces for creative and cultural (C&C) industries are provided so as to capture the latest technological advancement of their own innovation and entrepreneurial process. Residential development and recreational facilities, such as skate parks, are also provided in order to turn Strijp-S into a vibrant community for talents.

Singapore

- 3.3.3. Like HK, Singapore is facing a shortage of land for future urban and industrial development due to rapid population increase in the past decades. While reclamation has been widely adopted to increase the land resources as stipulated in the concept master plan in 1991, the Singaporean government has also put forth measures to intensify the underused land at the developed area through the JTC Corporation (JTC), a state owned company and the principal statutory board for industrial development of the region. For industrial development, such underused land are mainly from two sources, namely intensification of existing industrial sites and utilization of land for utilities such as landfills and chemical storage. As these sites may often be contaminated due to their previous uses, Environmental Baseline Studies and subsequent decontamination works are legally required for all JTC-related lease agreement when pollutive industries are concerned (JTC, 2001).
- 3.3.4. For the existing industrial sites, the Industrial Plan for the 21st century by JTC set out the aim to increase its plot ratio through lease control in order to opt for more intensive use of the land. Certain threshold of plot ratio will need to be increased for new buildings, while lease extension with waived premium can be applied if existing buildings could increase their plot ratio or return any unused land. Under Industrial Redevelopment Program (IRP) since 1997, JTC has performed en-bloc redevelopment of old industrial estates with low plot ratio through acquiring the outstanding leases with compensation package to the property owners, redeveloping into modern industrial buildings with higher plot ratio, and allocating the land to the higher value-added companies. At the same time, other community facilities are provided at the originally single-used industrial area. The Singaporean government adopted various measures to ensure the highest level of efficiency is being achieved in existing and future land uses.
- 3.3.5. One of such cases is the currently-under-construction Defu Industrial Park. The predecessor of the Defu Industrial Park is the Defu Industrial Estate, a 130-hectare industrial estate built in the 1970s. As the home for traditional small-scale industrial enterprise in factories with a height of at most four-stories, the Defu Industrial Estate has an average plot ratio of less than 1.0. Therefore, the Singaporean government announced its plan to redevelop the estate into “a green and sustainable industrial park of tomorrow” through IRP in 2012. When the redevelopment process is to be completed, there will be a five-times increase in floor space area within the new industrial park. It will be separated into three zones. The current companies will be relocated to the modern large floor-plate ramp-up industrial complexes in the Southern Zone, the Northern and Central Zone will house some of the higher value-

added I&T industries such as biomedical and clean energy industries. Living quarters as well as other commercial and recreational facilities will be provided to provide a vibrant working and living environment, in addition to the integrated road and cycling network linking it to the nearby Defu City Centre and other public transportation facilities. A vibrant community is developed with a better mixture of employment uses, residential units, and recreational facilities.

San Francisco Bay Area

- 3.3.6. As the remains of the World War II shipyard, the city of Richmond in Contra Costa County of the San Francisco Bay Area suffered from industrial pollution, and some of the lands became brownfield sites. A great transformation of brownfield sites to green infill has taken place not only to reduce pollution, but also revitalise their neighborhoods. The Miraflores green infill project showcases a successful transformation of brownfield sites, and the positive externalities of bringing benefits to the city and its neighborhood (Viani, 2017).
- 3.3.7. With the site area of 14 acres, a former Japanese-American-owned nursery was protected in respect of its history. Apart from the preservation of several old greenhouse structure, water tower and tank, and two indigenous family homes were remained in remembrance of its past. Affordable, solar-powered senior housing, privately-owned condos, and 5.4-acre of greenbelt were introduced to the community after the reutilization of the brownfield sites. One important point to note regarding the transformation of brownfield in Richmond is the active participation of community members in the transformation project. The city council's members, citizen activists and non-profits organizations were engaged the Miraflores from the very beginning and were able to bring the voice of the community in the city's and state's meeting.
- 3.3.8. The construction of senior apartments aims to address the Bay Area's housing shortage and affordability issues, while the greenbelt targets to link up the residential areas and public transit station by providing a comfortable walking environment. This marks the effort of encouraging people to use public transportation instead of driving their own cars which also contributes to improving the environment of the neighborhood by utilizing the land resources more efficiently.

Key Takeaways to HK

- 3.3.9. HK has a similar concern towards the existence of brownfield sites as illustrated in the cases above. It inspires the intensification of under-utilized space in HK to accommodate new homes and spaces for the I&T sector. When consider the future usage of the underused land, it is suggested that HK can make use of its brownfield sites not only to strengthen its economy through the incorporation of high-value added industry, but also to combine the functions of satisfying housing needs and encouraging the linkages between the redeveloped areas and existing or proposed transport links, in order to increase the vibrancy of the community and increase the linkage with other major developed areas in the city.

Transport Infrastructure and its Surrounding Uses

Top Technology Region/ Eindhoven-Leuven-Aachen Triangle

- 3.3.10. Since the development of high-tech clusters within the TTR-ELAt region predated any government initiatives, there was no comprehensive transportation

infrastructural planning during the development period of the region. However, efforts were made by city government in capturing the benefits brought by cross-border infrastructure to the surrounding land. For example, Flight Forum, a business and technology park, was being set up next to Eindhoven Airport, is home to a dozen I&T companies such as ATOS (information technology) and IFS BV (software development). The same phenomenon can also be observed in other cross-border infrastructure within the region, such as Liège Airport, Maastricht Aachen Airport and Liège Triligiport.

- 3.3.11. With the increased emphasis on the collaboration between sub-region, authorities have also increased their effort in the provision of transportation network within TTR-ELAt. International linkage is emphasized to increase the innovation potential of the area through additional access to technology and innovation sources, as well as international market for commercialized products. In the Brainport 2020 Action Plan for the Southeastern Netherlands, it states that the domain of people is one of the aspects that should be enhanced for the collaboration with TTR-ELAt. It stresses the importance of enhancing the accessibility within the region and internationally through measures such as improved rail (with focus on high speed train network) and road connections. To achieve greater connectivity and thus collaborative potential within the region, three projects were proposed by the province of Limburg, the Netherlands, to connect the whole regions through high speed rail. Upon completion, this high-speed rail network costing €300 million can not only would link Limburg with all the major cities within the region (e.g. Eindhoven, Aachen, Leuven), but also connect the region to other main urban areas such as Amsterdam, Rotterdam, Cologne and Antwerp. In a smaller scale, cities are also linking up their innovation hubs with the larger transportation network. Eindhoven links the guided electric bus network with Eindhoven University of Technology, as well as to the airport and the Flight Forum via the Brainport innovation region. While some of the funding came from the EU, these projects were usually initiated by the sub-regions governments which have a better understanding on the situation.

Singapore

- 3.3.12. Like HK, Singapore has long recognized the need of integrating land use and transportation in its planning. The approach of allowing corridors for MRT to connect new towns with the city center was already stipulated in the 1971 Concept Plan. To further reduce the need for travel, the 1991 Revised Concept Plan stated that employment centers such as industrial estates and business parks should be located near residential areas, especially in the east. Development of higher density should also be concentrated adjacent to the MRT stations. With four regional centers (Jurong East, Woodlands, Beletar, Tampines) identified for the decentralization of commercial activities, the concept plan proposed to link up these areas through orbital railway network with each other and radial network to the city center. These four regional center will coincide with the clusters of industrial parks that we are able to identify today (Figure 3.3).

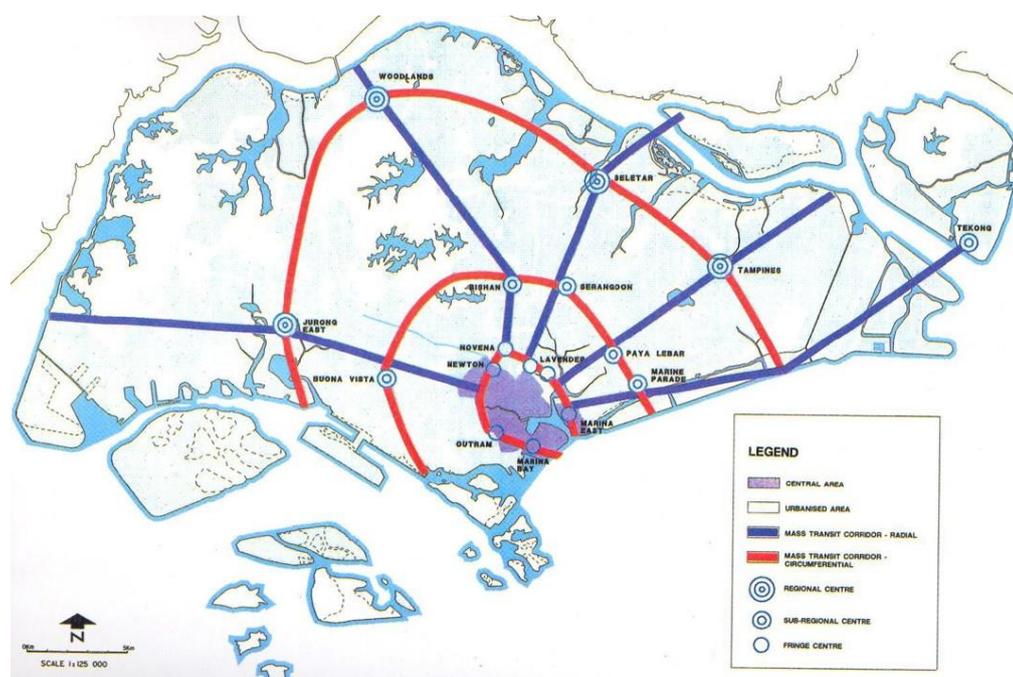


Figure 3.3 1991 Revised Concept Plan on regional centres and railway network
 Source: Chin & Foong, 2005

3.3.13. With innovation increasingly stresses on the importance of international connection on top of local connection, the government has also looked into the provision of I&T spaces with reference to its cross-border infrastructure. With the presence of Changi Airport, Changi Region is positioned by the government as the “business gateway to the world”. One of the initiatives to actualize such goal is the setting up of the Changi Business Park. At 71.07 ha, it is the largest integrated business park in the country. The connectivity to the other parts of the world (less than 5 km from the airport) has attracted many multinational I&T firms and institutes to set up branches there, such as IBM, Hitachi and MITRE R&D Centre. To provide additional knowledge input to the innovation cycle, the Singapore University of Technology and Design was established right next to the Changi Business Park in 2008. Additional MRT line will also be provided to link the area to the traditional downtown area.

San Francisco

3.3.14. Facing the similar problem as HK, the Bay Area has spatial mismatch between residential area and workplace with the overcrowding of the local railway system BART. Therefore, the Plan Bay Area 2040, a state-authorized, integrated transportation and land use plan, was proposed in 2017 by the Metropolitan Transportation Commission and the Association of Bay Area Governments. The strategic planning document outlined the short-term and long-term transportation strategies, investments and projects with the total amount of \$304 billion forecasted expenditure to operate, maintain, modernize, expand, and reserve for debt service and cost contingency.

3.3.15. Among the billions of discretionary funding, around 15 percent is invested to increase the Bay Area’s core transit capacity by bridging residential areas with workplaces, especially between San Francisco and Silicon Valley. The major transit expansion and modernization projects include extending BART to Silicon Valley, increasing frequencies and capacity of BART, increasing light rail and bus frequencies and

services (Figure 3.4). It is shown that the government does not rely solely on one type of transport (in this case, BART), but also encourages the efficiency of other transport mode in addressing the overcrowding issue of BART.

Rank	Project	Investment* (\$ Billions)
1	California High-Speed Rail (Bay Area Segment)	\$8.5
2	Regional Express Lanes	6.0
3	BART to Silicon Valley (Phase 2)	5.5
4	BART Transbay Core Capacity Project + BART Metro Program	4.6
5	Caltrain Extension to Transbay Transit Center**	4.1
6	Caltrain Electrification (Phase 1)	2.4
7	Clipper	1.7
8	San Francisco Muni Fleet Expansion	1.3
9	Bay Area Forward	1.0
10	Treasure Island Mobility Management Program	1.0

* Investment values are costs within the plan period and include operating expenses; shown in year-of-expenditure dollars.

** Does not include \$109 million already expended on the project.

Figure 3.4 Top 10 Plan Bay Area 2040 Investments

Source: Metropolitan Transportation Commission, 2016

3.3.16. Besides its strategic transportation plan, the core strategy of Plan Bay Area 2040’s “focused growth” emphasizes that the development in existing communities should be aligned with the current transportation network. With the above focus, it ensures that the existing infrastructure should be better utilized and targeted towards the existing communities, in order to diminish the negative impacts brought to less developed areas. Land use decisions will be made in a smarter manner through the identification of Priority Development Area (PDAs) where growth and development will have a higher priority than other areas. One key measure is to lower the construction cost by minimizing parking and up-to-date environmental authorization.

Key Takeaways to HK

3.3.17. It can be observed from the above cases that a holistic planning is needed for transportation and I&T planning. Transport infrastructure in the San Francisco Bay Area and Singapore case are strategically planned with the future development in mind. The overarching strategy of future development in San Francisco Bay Area is “focusing growth” in developed areas but not sub-urban areas. This is to minimize the adverse impacts brought to the less developed areas. Smarter land use decisions are made through PDAs identification, which prioritizes development in the existing community with existing transport infrastructure. HK has to take into account the possibility of enriching and enhancing its existing communities so as to reduce the resources and capital needed to create additional transport infrastructure to support the future development. It could also be observed that the international connectivity brought by cross-border transportation infrastructure would be a major growth source to the I&T sector, with Singapore planning comprehensively and TTR-ELAt

performing catch-up work in this regard. With multiple cross-border facilities within the city, this can give rise to a huge opportunity of jumpstarting selected I&T sector by utilizing the surrounding land use.

Integrated Development Model

Top Technology Region/Eindhoven-Leuven-Aachen Triangle

- 3.3.18. The specialisation of the TTR-ELAt in chemical and advanced materials, high-tech systems, and health science is the result of market evolution rather than government initiatives. This has led to the uneven distribution of these fields among the regions. For example, the presence of the Philips headquarter led to the concentration of the high-tech systems sector in Eindhoven and Leuven. Such diversity of specializing in different areas can also be identified in a smaller geographical scale. For example, Leuven specializes in nanotechnology, Liège in aerospace research, Aachen in energy and mechanical engineering, and Maastricht in cardiovascular research.
- 3.3.19. With such diverse but complementary specialization for different sub-regions, the major role for the government is to adopt a flexible approach to maximize the opportunities for companies and institutions in TTR-ELAt to undergo innovation collaboration. Known by the regional institution as the variable geometry approach, such principle indicates that not every sub-region is required to participate in the initiatives, since their specialties may not be complementary. Instead, sub-regions are encouraged to form bilateral or multilateral efforts as opportunities arise. For example, the production of Street Scooter, a brand of electrical vehicles, is a collaborative product between the research institute in the University of Aachen and Nedcar, and its automotive plant is located in Limburg. Individual collaboration initiatives can also mobilize actors in between the regions, such as the advanced service industry in Brussels to participate in the completion of the production chain when they see fit.
- 3.3.20. This kind of bottom-up collaboration is encouraged through the adoption of different cross-border policies. For example, innovation vouchers of €5,000 per business case can be applied for industrial research of the local knowledge institutes within the area. Funding from different sources can be combined for the construction of cross-border and cross-sector innovation facilities. One of the examples is the Holst Centre with the co-funding of Dutch and Belgium authorities, the Holst Centre was co-established by the Interuniversity Microelectronics Centre (IMEC) from Flanders, Belgium and the Netherlands Organization for Applied Scientific Research (TNO) in the High-Tech Campus Eindhoven in 2005. This cross-border research center is a collaborative effort between IMEC and TNO in carrying out research to take advantage of the specialization and resources in both areas. Working with 40 of the industrial actors within the High-Tech Campus can enable their research to be turned into sellable products. This serves as an example of the completion of production chain at the regional level.

Singapore

- 3.3.21. The government has played an active role in developing its I&T sector since 1980. In order to raise the level of local innovation and decrease its reliance on foreign investment, a series of national 5-year plan on science and technology has been proposed by the government since 1990, investing about US\$50 billion to the sector

- in 25-year time. This commitment in public research investment can be reflected by the high level of R&D expenditure, which accounted for 2.2% of the GDP in 2004. The Research, Innovation and Enterprise Council (RIEC) was set up in 2006 for an advisory role on the relevant policies to R&D. In parallel with the public funding and the setting up of responsible agencies, multiple support schemes, such as financial support, incubator schemes, as well as the options of collaborating with private sectors have been provided to local startups.
- 3.3.22. Other than financial and institutional support, the government has also provided many physical infrastructures for the I&T sector via JTC. While the earlier development by JTC is usually of single use designated for a few chosen industries (e.g. Singapore Science Park and Tuas Biomedical Park), those developed after the turn of the century have adopted the idea of “live-work-play” with integrated master planning. One major example is One-North. Not only does it act as the ‘Super-Creative Core’ with different R&D clusters for biomedical, physical science, engineering, media, it also has a mixed use of residential units, commercial spaces, hotels, schools, urban parks and greenery. This is an example of a combination of workplace and talent communities in close proximity. The government also jumpstarts the cluster development by setting up public research institutes within the cluster and attracting multinational firms to set up branches so as to encourage the interaction between the institutional and commercial sectors. A large-scale attempt of such agglomerated uses within one single business park is the Jurong Innovation District. This 600-hectare site is integrated with the Nanyang Technological University, the mixed R&D space and manufacturing facilities together can allow companies to complete the whole supply chain from research, design, prototype to manufacturing within the same area.
- 3.3.23. The government has created several zonings to facilitate this kind of development. While ‘Business Park’ zoning has been created since 1990 for the formation of business and science parks, two new types of zoning, namely ‘Business 1’ and ‘Business 2’, have been added in the 2008 Master Plan to further separate the use of light and heavy industries. To facilitate mixed use, a ‘white’ zone could be added to each of these three business zones, which would allow the development of residence, offices, hotels, entertainments etc. within the park. Other than zoning, the government also helps the formation of industrial cluster by setting up branches of public research institutes within the park for managing and encouraging the synergy effect.
- 3.3.24. While continuous governmental support has been provided via the national plans in science and technology, universities have also strived for integration with the commercial sector. NUS is the most comprehensive university in the country, transforming itself with the model of an entrepreneurial university. A new division called the NUS Enterprise has been set up with the mission of technology commercialization through measures such as lowering the licensing fee and aiding professors on launching their products to the commercial world. NUS Overseas College Program is also set up to send students to overseas entrepreneurial hubs for a year-long internship in high-tech start-up firms so as to nurture their ability in turning research into actual products.

San Francisco Bay Area

- 3.3.25. Stanford Engineering School has been serving as the regional academy in technology development since the 20s due to the lack of relevant academic development in the region, not to mention the absence of technology-based industry. The Dean of the Engineering School soon realized the importance of having technological industries in the region, and thus put forward three academic development strategies in the 30s: (1) developing connections between engineering and science; (2) associating local science and technology-based companies with academics departments of engineering and science; (3) centralizing resources on several key research focuses with academic and industrial potential.
- 3.3.26. Since then, the boundaries between industries and universities became blurred. Professors and students together shared numerous inventions, under the collaboration with other start-up companies within the region, which further promoted the status of Silicon Valley. The university functioned as a platform which fostered the collaboration of companies and students, as well as a center for sharing the results of academic research among high-tech firms. The close working relationship between the university and the industry not only benefits the development of high-tech firms in the region, the students can also testify their academic knowledge, as well as their technical and managerial skills. Benefiting from agglomeration economy, many tech companies continue to set up their firms in Silicon Valley in order to capture the economic benefits of shared infrastructure and personnel, which is exceptionally popular among start-up firms.
- 3.3.27. Apart from the increasing partnership between technology-based firms and Stanford's research, the favorable government policy also contributed to the long-term growth of 'science park' by extensive land holdings in the 50s. Setting up the criteria for entering the "science park" as R&D oriented, the R&D-centered Stanford University and high-tech firms both expressed interest towards setting up in a location nearby university. With reference to other science parks, such as the Kista Science Park in Stockholm, external decision makers, such as government intervention, was present. Hence, the ecosystem for the formation of the high-tech firms cluster alongside with university presence in Silicon Valley was further facilitated.
- 3.3.28. In recent years, the Bay Area Council has proposed its first Regional Economic Strategy in enhancing its economic resilience. One of the strategies is to establish the Bay Area Collaboration on Workforce Development by incentivizing private sector involvement through some workforce development funding programs which increase the partnership between universities and business. Through increasing communication between university and industry, the programs offered in university can be more market responsive and industry can provide more relevant training to students.

Key Takeaways to HK

- 3.3.29. Triple helix model in above cases showcases the agglomerative advantages of integrating university, industry and government in fostering I&T sector development even though their importance varies among cases. From the concentration of resources for the commercialization of research from universities, to the formation of 'science park' combining the education institution and high-tech start-up firms with

- favorable government policies, it is derived that the integrated development model can be adopted as a way to effectively utilize the roles of university, industry and government. These stakeholders can complement each other with their particular functions.
- 3.3.30. In HK, the functions and land uses of future I&T clusters should be highly integrated to enhance the competitiveness of the I&T cluster. The integration aims to develop a comprehensive I&T hub in HK, GBA, and eventually gains a reputation of the “Silicon Valley” in Asia. Since the existing I&T parks (Cyberport and HKSTP) are already developed alongside with universities, the proposed science parks should be planned to embrace integrated development model to ensure education institution and high-tech firms are in close proximity in order to facilitate a higher degree of collaboration.
- 3.3.31. Besides, the focus of future I&T development in HK should take into account the gap of the existing I&T facilities along the stages in the production chain in HK and SZ in determining the fields and industries of I&T development. HK might consider having university as anchor and foundation of deciding the future focus of I&T development. This can help the stakeholders to effectively concentrate their resources on aspects for the I&T industries and possible specialism. At the same time, universities and the industry should have more interaction and communication to be increasingly responsive to market needs. For instance, shared researches, platforms and work placement programmes can be considered to increase the collaboration between universities and the industry. The details of the spatial policies can be seen in Chapter 7.

4. Spatial strategies and policies in GBA and SZ

4.1. Strategic direction and positioning from GBA initiative

- 4.1.1. The concept of GBA was originated from “The Action Plan for the Bay Area” of the Pearl River Estuary in 2011. The GBA unifies HK, Macao and other areas in PRD as one region to be an ideal place for living, working and traveling (HK Government, 2011; Constitutional and Mainland Affairs Bureau, 2018). The initiative also aimed to enhance synergies between companies within the GBA, in order to allow freer flow of people, capital and services.
- 4.1.2. In the 19th National Congress of Communist Party of China, the vision of maximizing the comparative advantages through the 9+2 cities was detailed out. The 9+2 cities within the GBA context have their positions being clearly defined. The divided positioning is to make clear of each city’s comparative advantages, as well as enabling complementary effects between cities to strengthen the regional economy. Figure 4.1 lists out the positions of the 9+2 cities. SZ acts as the bridge of utilizing the strengths of the 9+2 cities, and facilitating regional integration and cooperation, in order to guide regional economic development as a whole (ibid.).



Figure 4.1 Positioning of cities in GBA
Source: Legislative Council, 2017; edited by Study Team

- 4.1.3. Out of the 9+2 cities, HK and SZ are characterized by their strengths of being positioned in strategic location and in close proximity to each other. Therefore, the collaboration between HK and SZ has a prolonged history. The strategic position of HK was being mentioned for the first time in the National 13th Five-Year Plan, which was announced in 2016. Soon after, HK, Macao, and Guangdong jointly signed the

Framework Agreement in 2017. HK’s position as the international financial center is recognized and upheld, and the city also acts as China’s gateway to the global market. Positioned with its strong economic role, HK has to maintain this strength by diversifying economic sources to the I&T industry in order stabilize income source, as well as emerging to become an international I&T hub (HK Government, 2018).

- 4.1.4. On the other hand, SZ is positioned as the most successful high-tech city with high level of R&D input in mainland China. The development of I&T industry is highly mature, and has a high level of concentration of headquarters from the I&T companies within the city. Apart from its strong performance in the I&T sector, the city also has an integrated transport system to support the logistics industry in the GBA (Ibid.). The respective positioning competitive advantages and opportunities of HK and SZ are elaborated in Table 4.1. The positions of SZ and HK are complementary to each other, which provides a high level of potential for regional collaboration. By regionally collaborating with SZ, HK can benefit from the complementary and synergy effect of maximizing the comparative advantages between two cities. The regional collaboration with SZ through the I&T sector can facilitate HK in pursuing sustainable economic growth and developing I&T sector as one of the strength industries.

Table 4.1 Hong Kong-Shenzhen integration in GBA initiative

	Position in GBA	Competitive Advantages	Future Opportunities
Hong Kong	<ul style="list-style-type: none"> ▪ Provide physical connectivity ▪ Centre for International financial centre, professional services ▪ Mature legal system 	<ul style="list-style-type: none"> ▪ Gateway of trade ▪ Attract foreign investment to and from Mainland to support economic growth in GBA ▪ Free and open economies ▪ Form complementary functions with Shenzhen ▪ Nurture talents for I&T and medical industry 	<ul style="list-style-type: none"> ▪ Strengthen existing economic pillars ▪ Diversify economic structure, i.e. I&T and C&C industry ▪ Influx of talents ▪ Emerge as international I&T hub
Shenzhen	<ul style="list-style-type: none"> ▪ Advanced technology ▪ Modern logistics ▪ Emerging I&T industry ▪ High input in R&D 	<ul style="list-style-type: none"> ▪ Integrated transport network ▪ Efficient boundary checkpoint on land, sea and for air traffic 	<ul style="list-style-type: none"> ▪ Influx of educated talents ▪ Promote livability to retain talents, e.g. Mature medical service

Source: Planning Department, 2016; ACCA, n.d.; HKSAR, 2018; Constitutional and Mainland Affairs Bureau, 2018; German Industry and Commerce Ltd., 2019; Constitutional and Mainland Affairs Bureau, 2019

- 4.1.5. The main aim of GBA is to enhance the overall competitiveness of the city-region. As HK and SZ are located in close proximity, the two cities have a high potential to collaborate and integrate. In addition, the “Outline Development Plan for the Guangdong-HK-Macao Greater Bay Area” has announced a series of policies to increase collaboration between HK and other cities in the GBA. The main strategies and policies and policies are shown in Table 4.2.

Table 4.2 The main spatial strategies and policies in GBA

Purposes	Strategies	Policies
Enhance regional collaboration	Optimize regional spatial structure	Develop 3 major metropolitan areas and regional development axes
Strengthen I&T collaboration	Promote the establishment of “Guangzhou-Shenzhen-Hong Kong-Macau” Innovation and technology Corridor	Explore policy measures that contribute to cross-boundary and regional collaboration and jointly develop GBA as the platform of international innovation
Improve transport network	Rapid Transport Network in GBA	Establish strategic contact networks between HK, SZ and the Western PRD, and strengthen regional interaction
	Seamless connectivity in cross-boundary transportation	<ul style="list-style-type: none"> ▪ Link up major city nodes in GBA through the construction of large scale facilities, and transportation networks of railways and expressways ▪ Improve the efficiency and capacity for BCPs
	One hour inter-city circle	Strengthen the accessibility between GBA cities
Improve livability	Livable GBA	Provide a quality living circle for living, working and travelling in the GBA
Favorable taxation rates	Preferential Taxation Policy	Provide subsidies for overseas high-skilled talents working in the GBA

Source: Development Bureau & Planning Department, 2016; Planning Department, 2008; Planning Department, 2009; Constitutional and Mainland Affairs Bureau, 2018, Legislative Council, 2017, Constitutional and Mainland Affairs Bureau, 2019; State Taxation Administration, 2019

Key takeaways from the spatial and aspatial policies in GBA to HK

- 4.1.6. As shown in Table 4.1, HK is positioned as an international financial centre and SZ as an I&T hub. HK can continue to utilize its strength in the financial sector which can create a complementary effect with SZ with the I&T sector. HK can capitalize on its financial sector by further developing FinTech, and diversify the I&T sectors to BioTech, Smart City, and AI through regional collaboration with SZ.
- 4.1.7. Table 4.2 shows the spatial and aspatial policies of GBA in making it an attractive environment for accommodating the I&T industries. At the connectivity level, HK is likely to be increasingly connected with SZ by developing the Eastern sub-region and utilizing the bridge to strengthen the linkages with other cities. “Guangzhou-SZ-HK-Macao” I&T Corridor connects the major I&T nodes through significant improvements to transport infrastructure. This corridor can improve the exchange of I&T knowledge and production. Therefore, Hong Kong can benefit from the increased collaboration in the I&T industry and the completion the production chain at the regional level. Transportation is one main factor in the facilitation of collaboration between HK and the GBA. The improved transport network will enhance the regional interactions.
- 4.1.8. On top of the spatial strategies, aspatial policies also contribute to the success of the I&T industry in SZ. Liveability is one of the key determinants regarding talent

attraction. Therefore, as shown in table 4.2, “Liveable GBA” is proposed to provide strategies in enhancing the living and working conditions so as to retain and attract local and foreign talents. GBA also has preferable taxation to provide incentives for talents to reside and work in GBA. HK can have the key takeaways of prioritizing livability in designing the new I&T nodes, and to incentivize talents with relevant policies.

4.2. Positioning in SZ Regions and their economic contribution

4.2.1. The overall industrial structure in Shenzhen has been continuously changing. The ratio of primary, secondary, tertiary industries in SZ has changed from 0.1, 41.4, 58.5 to 0.1, 41.1, 58.8. It reveals that the importance of tertiary industry has risen over the years and the core focus on I&T sector shows the ongoing process of re-industrialization in SZ. It has the trend of developing its tertiary industry which includes many stages in the production chain (SZ Municipal Government, 2018).

4.2.2. As shown in Figure 4.2, the regions in SZ share different roles in the production chain and have distinctive specialized I&T fields. Eastern SZ acts as the base of production and innovation, and mainly specializes in BioTech. However, both Central and Western SZ perform diverse roles along the stages of the production chain. Central SZ focuses more on innovation, whilst Western SZ emphasizes more on commercialization and services. Also, the latter two regions put high emphasis on R&D and advanced manufacturing. As for the I&T specialism, the Central SZ specializes more in robotics and software, whereas the Western region puts a stronger emphasis on modern logistics and big data.

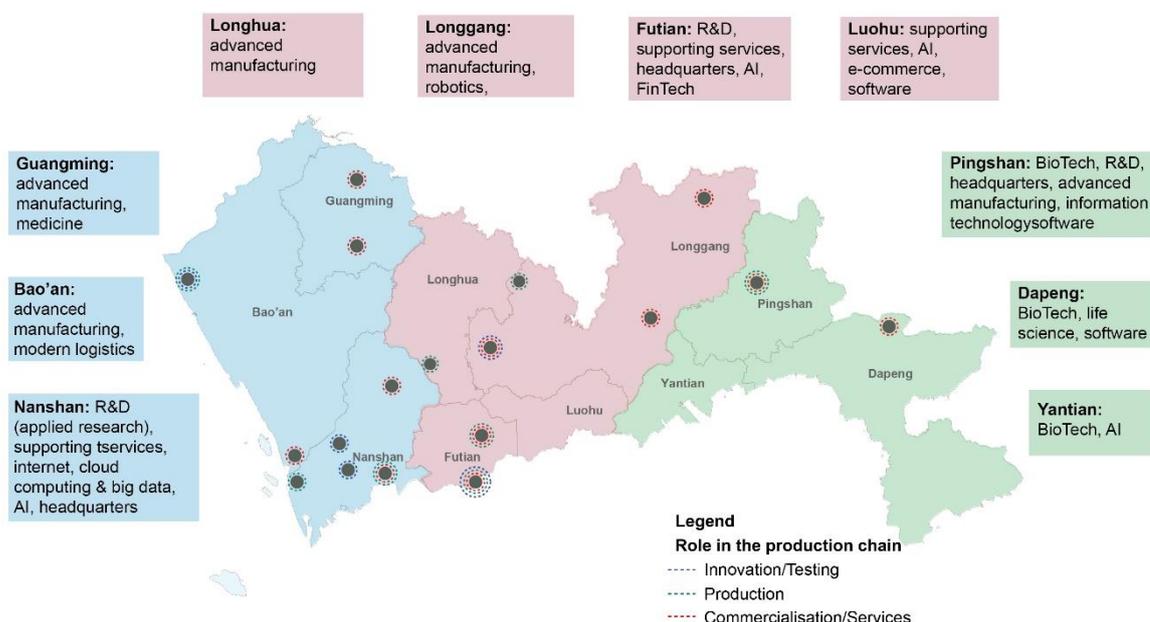


Figure 4.2 I&T industrial positioning of districts, locations of key I&T-related clusters and their roles in the production chain

Source: Study Team

4.2.3. Positioning in Western SZ

- 4.2.3.1. The Western region of SZ has a strong economic power to the city. The total GDP for Nanshan, Bao'an and Guangming Districts are RMB 995.66 billion, which accounted for 44% of the total GDP of SZ (Shenzhen Statistics Bureau and NBS Survey Office in Shenzhen, 2018). Among the three, Nanshan has the greatest contribution among all districts in SZ in terms of GDP with RMB 501.8 billion in total.
- 4.2.4. As shown in Table 4.3, Nanshan is the core of applied research and innovation in Western SZ, with various I&T infrastructure in supporting its development. University Town is also located within this district, positioning it as a talent highland in the city. Moreover, Qianhai, the national base of modern service industries, provides high-end services for I&T industries, serving as a supporting platform for the region.
- 4.2.4.1. On the other hand, Bao'an and Guangming have the solid foundation for advanced manufacturing, completing the production stage of the production chain in the region. Furthermore, the Bao'an International Airport grants the region the competitive advantage to connect the district to the regional market.

Table 4.3 Positioning of districts in Western SZ

Districts	Main positioning in production chain	Focus in I&T industry	Key development
Nanshan	Innovation, commercialization, services	R&D, supporting services, Internet, big data, headquarters	Qianhai, SZ High-tech Industrial Park, University Town
Bao'an	Innovation, Production, Connection to regional market	Advanced manufacturing, Modern logistics	Bao'an International Airport
Guangming	Commercialization	Advanced manufacturing, Medicine	Phoenix Town

Source: Study Team

4.2.5. Positioning Central SZ

- 4.2.5.1. In Central SZ, Futian, the commercial centre of the whole city, is the base of commercialization and services for I&T sector (Table 4.4). Meanwhile, it plays an important role for innovation in the production chain. In its recent plans, the Southern SZ-HK New Cooperation Corridor was proposed. The corridor is a highlighted feature to facilitate economic cooperation, particularly for the I&T sector. The corridor is built around a core formed by the Futian Free Trade Zone, Futian Port, Huanggang Port, and LMCL Area C (Futian Government, 2018). These areas will also form the SZ-side of the SZ-HK Technological Innovation Special Cooperation Zone (Figure 4.3). The Corridor and the existing BCPs provide integrated functions for R&D, tertiary education, free-trade logistics, manufacturing and super transit hub (SZ Tequ Bao, 2018). These can synergise with the R&D and tertiary educational institution proposed in the HK-SZ Innovation & Technology Park in LMCL, which is part of HK-side of the Cooperation Zone.

Table 4.4 Positioning of districts in Central SZ

Districts	Main positioning in production chain	Focus in I&T industry	Key development
Futian	Innovation, Commercialization, Services	R&D, Supporting services, AI, FinTech	Futian CBD, Futian Free Trade Zone, SZ-HK Technological Innovation Special Cooperation Zone
Luohu	Commercialization, Services	Supporting services, AI, E-commerce, software	Luohu CBD
Lunghua	Production, Commercialization	Advanced manufacturing	Shenzhen North Station, Foxconn
Lunggang	Innovation, Production, Commercialization, Services	Advanced manufacturing, Robotics	Banxuegang Tech Park, SZ International Universities Campus

Source: Study Team

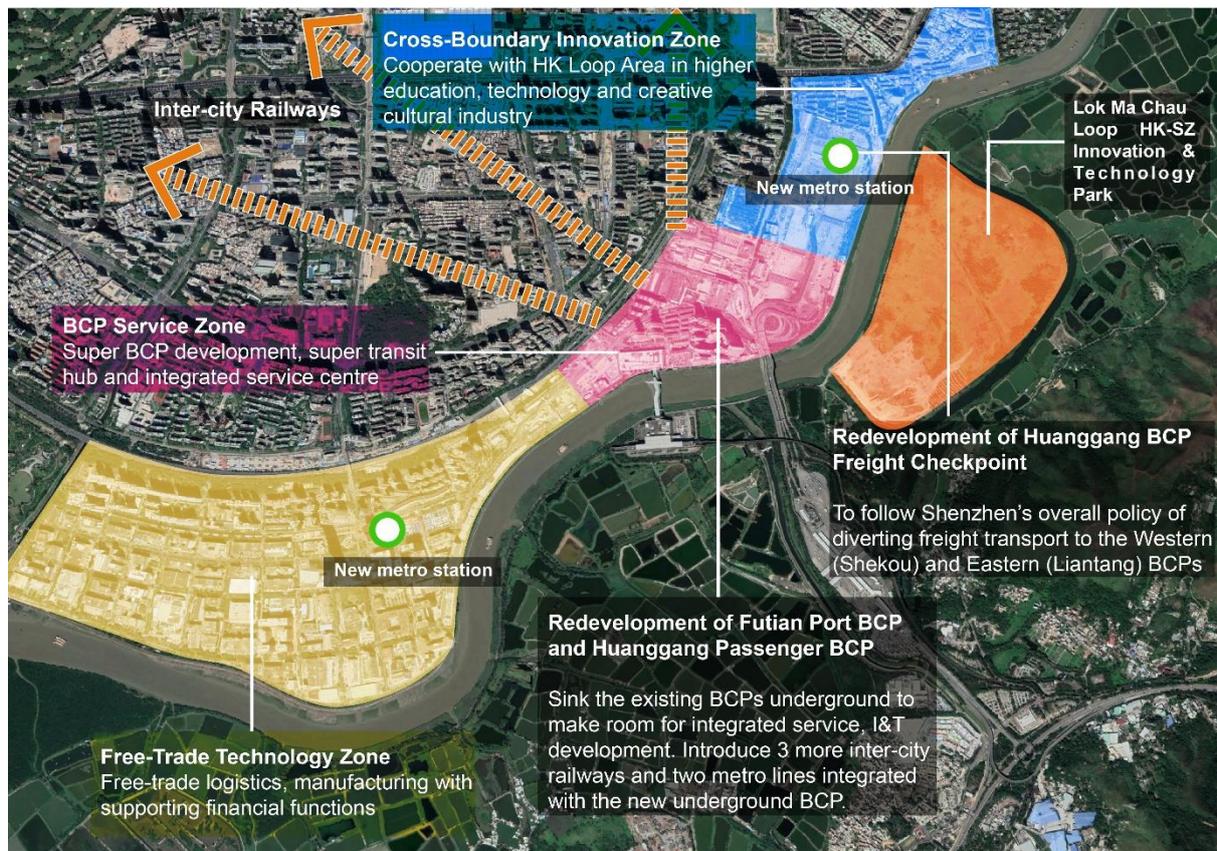


Figure 4.3 Highlights of the SZ-HK Technological Innovation Special Cooperation Zone

Source: Study Team

4.2.5.2. Luohu has the oldest history of development in SZ, and the district specializes in commercialization for the I&T sector. The district also has the ambition to further develop I&T. Figure 4.4 highlights the key development and infrastructure in Luohu District. The planned innovation and emerging industrial belt, especially the innovation zone in Liantang focusing on software and internet application, will also synergize with HK’s strategy of promoting I&T sector growth (Luohu District Government, 2016).

4.2.5.3. As for the other districts, Longgang is positioned as a leading center for production and research of emerging high-tech industries with large-scale, internationally-competitive enterprises such as Huawei and Biyadi. Longhua District, like Futian, also has planned CBD function adjacent to its HSR station. It stands out in this regard as the district is also a mature manufacturing base for electronics and other high-tech production. SZ has planned to extend the HSR network to Xili in Nanshan, Bao’an International Airport and Pingshan in the Eastern Region.

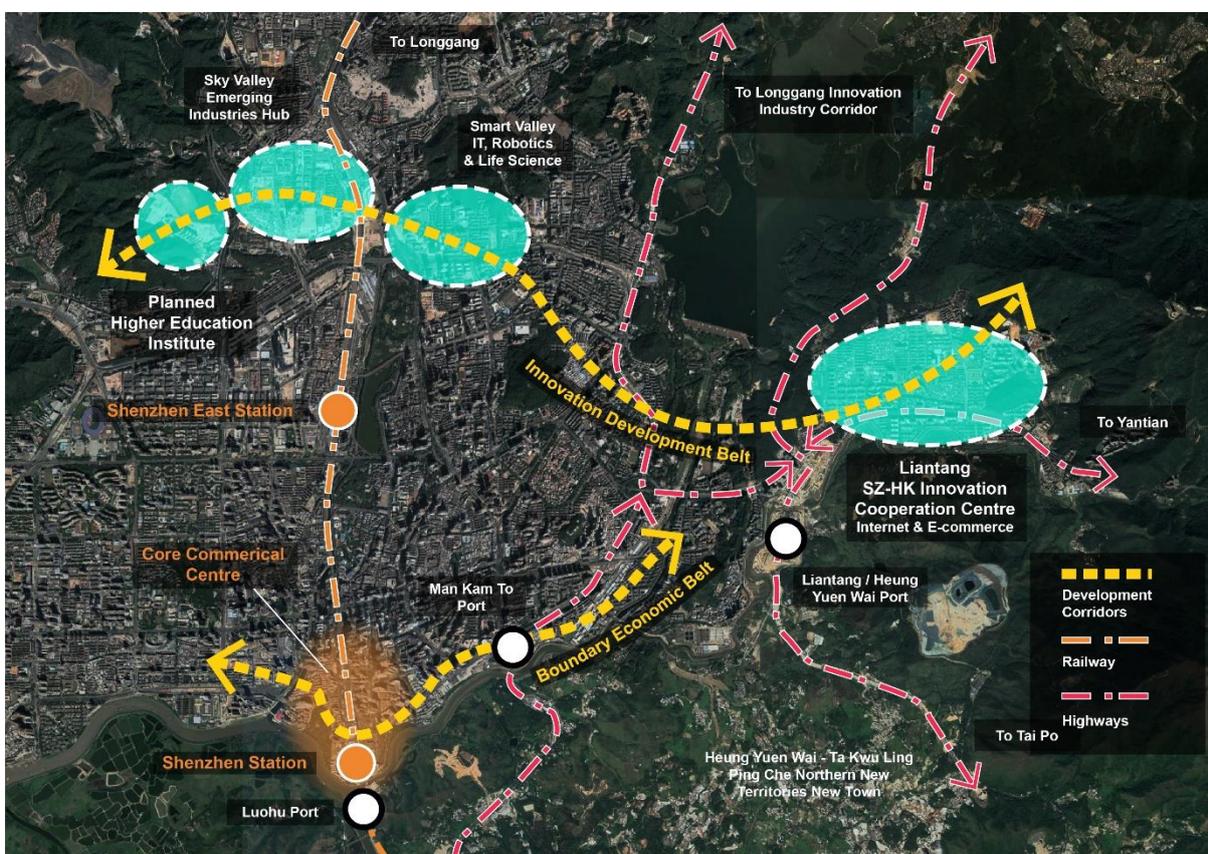


Figure 4.4 Key development and infrastructure in Luohu District
 Source: Study Team

4.2.6. Positioning in Eastern SZ

4.2.6.1. The “Go East Strategy” is one of the most important strategies for Eastern SZ. The Strategy is proposed to balance SZ’s development and the growth of “Shenzhen-Dongguan-Huizhou 3+2 Economic Circle” (Shenzhen Development and Reform Commission, 2016). With this strategy, cross-boundary collaborative projects, such as SZ-HK Youth Innovation and Pioneer Park, will be further promoted. The connectivity between HK, Eastern SZ, Huizhou and Dongguan will also be improved. As Huizhou and Dongguan have the competitive advantage in mass production, the

regional collaboration of HK can go beyond SZ in order to complete the production chain of the I&T industry (Table 4.5).

Table 4.5 Positioning of districts in Eastern SZ

Districts	Main positioning in production chain	Focus in I&T industry	Key development
Pingshan	Innovation, Production	BioTech, R&D, advanced manufacturing, information technology, software	National Biological Industry Base, National New Energy Vehicle Industry Base
Yiantien	Production	BioTech, AI	Life and Health Industrial Park
Dapeng	Innovation	BioTech, life science, software	SZ International Bio Valley

Source: Study Team

4.2.6.2. In Eastern SZ, all three districts share the similarity of specializing in the development of BioTech. Pingshan focuses on R&D and advanced manufacturing. Its comparatively diverse specialized I&T fields and high quality supporting platforms enable it to become the core of innovation and production in the region. Yantian District plays the role of production in the production chain with to its position as a sea port. Finally, Dapeng possesses the most outstanding ecological environment among the whole city, performs well in the field of BioTech with the support of Bio Valley.

4.3. Spatial Framework in SZ

4.3.1. According to Figure 4.5 with reference to SZ Master Plan for 2010 to 2020, SZ's spatial structure consists of three vertical (North-South) development axes, two horizontal (East-West) development belts and multiple centers (Shenzhen Municipal Government, 2008). The linkages, supported by various transport infrastructure, connect the major functional zones holistically. These linkages also increase connectivity to neighboring cities, including HK, Dongguan and Huizhou. Table 4.6 details out the functions of different development axes and belts in SZ.

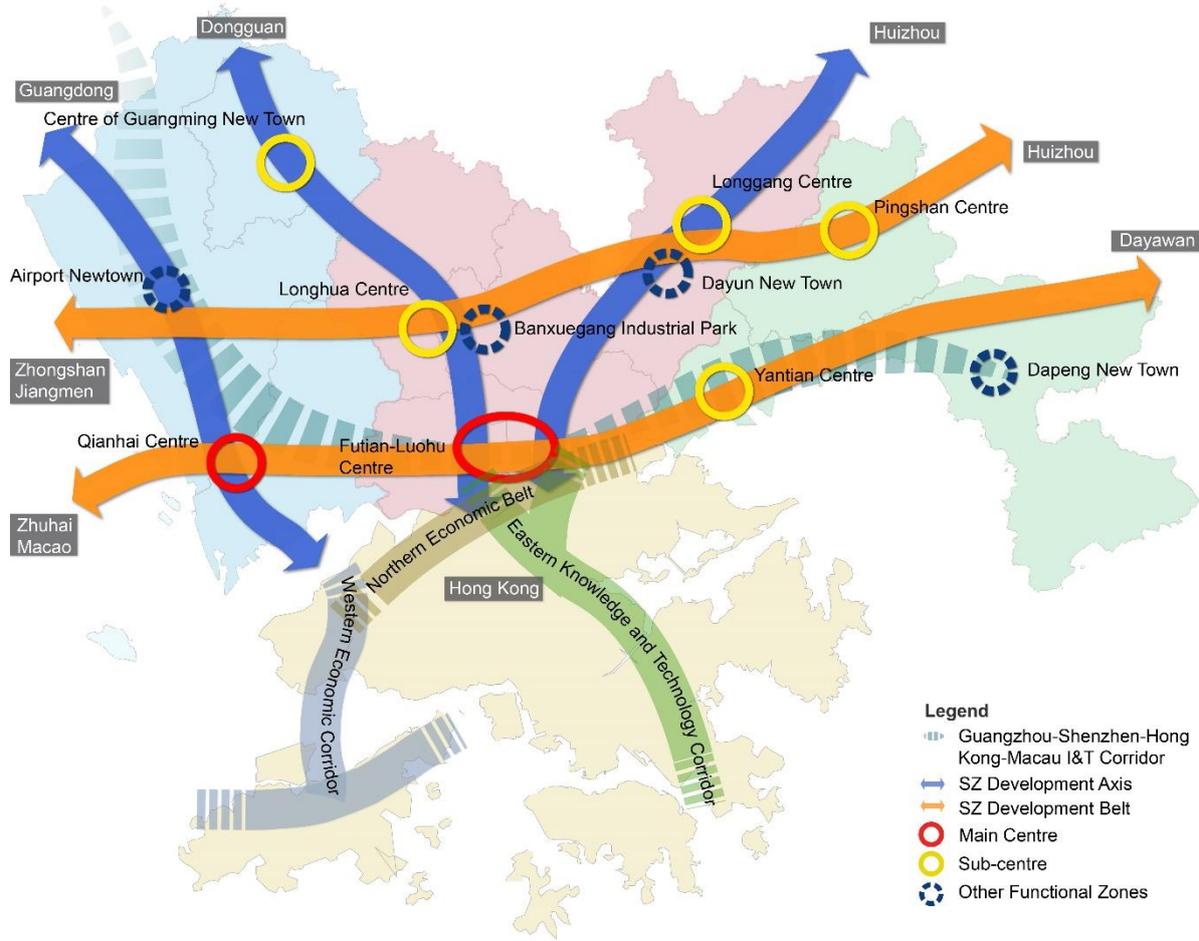


Figure 4.5 SZ conceptual spatial structure
 Source: SZ Municipal Government, 2008; edited by Study Team

Table 4.6 Transport infrastructure and functions of the axes and belts

Development Axes	Function
Western Axis	<ul style="list-style-type: none"> Strategic axis for strengthening the role of SZ as an international city and SZ-HK cooperation Development of producer services and strategic emerging industries
Central Axis	<ul style="list-style-type: none"> Dongguan-SZ-HK Regional Industrial Development Axis Development of comprehensive service and strategic emerging industries
Eastern Axis	<ul style="list-style-type: none"> Huizhou-SZ-HK Regional Industrial Development Axis Strategic axis to promote SZ's eastward development Development of innovation, education and emerging industries

Southern Belt	<ul style="list-style-type: none"> • International urban belt with emphasis to collaborate with HK • Development of comprehensive service industry
Northern Belt	<ul style="list-style-type: none"> • Regional industrial belt • Development of education and research, advanced manufacturing, etc.

Source: SZ Municipal Government, 2008; SZ Municipal Government, 2017

Western SZ

4.3.2. The Western Axis is positioned as a strategic linkage to facilitate SZ-HK cooperation and connects the key development nodes of Airport Newtown and Qianhai Centre in Western SZ (Table 4.6). The Southern Belt and the Northern Belt link up Southern SZ and Northern SZ respectively. The Southern Belt connects Western SZ to Zhuhai and Macao, whilst the Northern Belt connects the region to Zhongshan and Jiangmen (Figure 4.5). The Southern Belt and the Western Axis are both partially aligned with the Guangzhou-SZ-HK-Macao I&T Corridor, where many I&T nodes concentrate. Meanwhile, the Western Axis links with the Western Economic Corridor of HK while the Southern Belt is adjacent to HK's Northern Economic Belt (Figure 4.4). These implies that these two conceptual linkages in HK will have great potential to be further developed, especially for the I&T industries, in order to maximize the synergies by linking with SZ.

Central SZ

4.3.2.1. The Central Axis and Eastern Axis pass through Central SZ (Figure 4.5). The Central Axis connects the Central region (Futian-Luohu Centre and Longhua Centre) with the Western region (Guangming New Town). The Eastern Axis connects Central SZ in the eastward direction, connecting the key development nodes of Dayun New Town and Longgang Centre. Both of them are positioned as regional industrial axes and are connected to the intersections of the Northern Economic Belt and Eastern Knowledge and Technology Corridor on HK's side, ending at the strategic locations of LMC and HYW. The Southern and Northern Belts connect the Central region to other parts of SZ, passing through the nodes of Longhua Centre and Futian-Luohu Centre.

Eastern SZ

4.3.2.2. The spatial framework of Eastern SZ is still in progress of development. Throughout SZ, the Southern Axis and Northern Axis connect Eastern SZ to the other two regions at the Pingshan Centre and Yantian Centre (Figure 4.5). In the future, the Eastern Cross-Boundary Highway will strengthen connectivity of Eastern SZ with Liantang in HK.

4.4. Strategic Transport Network in SZ

Motorway and Expressway Network

4.4.1. SZ's motorway and expressway network consists of East-West and North-South roads, connecting the three regions and further extending to nearby cities (Figure 4.6). The current road networks in the Western and Central regions are comparatively more developed than the Eastern region. The Eastern region is envisioned to improve substantially in terms of its transport network in the future. The

new plan for the Eastern region aligned approximately ten roads to increase the region's connectivity with the other two regions. Meanwhile, most of the new East-West roads also assist with the development of the GBA through linking SZ with Huizhou, Shen-Shan Special Cooperation Zone and the cities across the Pearl Delta River (SZ Municipal Transportation Committee, 2018).

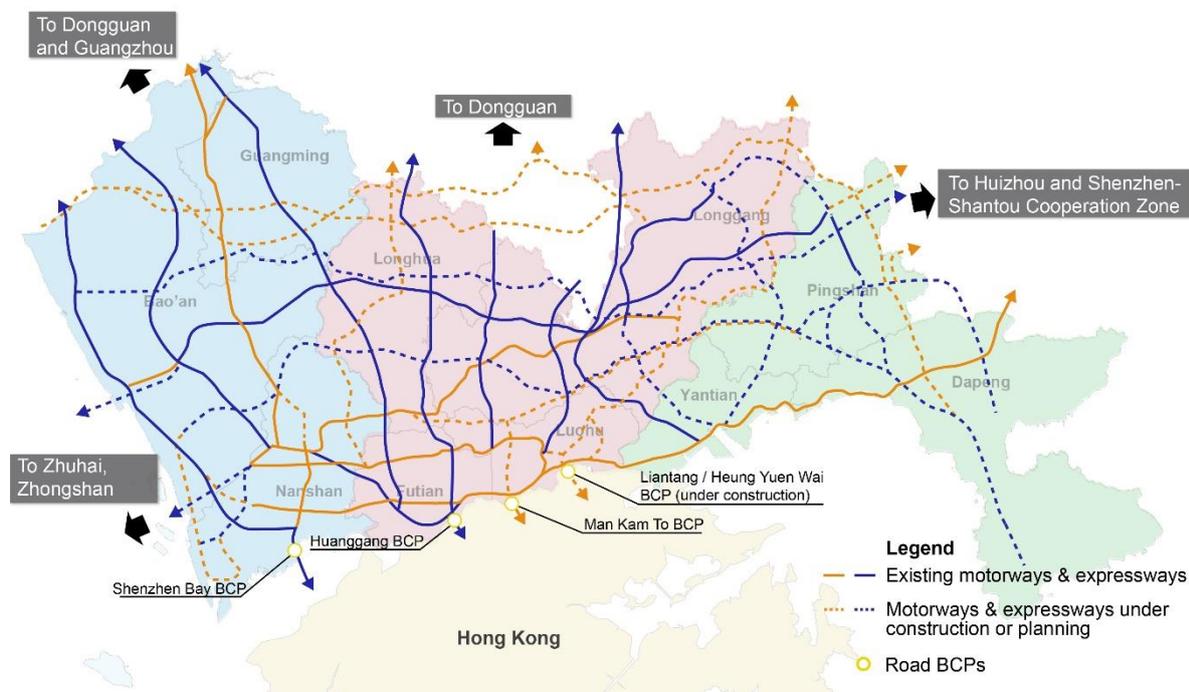


Figure 4.6 Motorway and expressway system of SZ
 Source: SZ Municipal Transportation Committee, 2018; edited by Study Team

Metro & Railway Network

4.4.2. Currently, all the metro lines are in the Western and Central regions, in which Nanshan and Futian Districts have the highest coverage of subway lines (Figure 4.7). With reference to the railway transport plan published in 2016, majority of the planned metro lines are intended to pass through the emerging transport hubs, namely the Xili Hub, East Airport Hub and Pingshan Station, in order to strengthen their functions (SZ Planning and Land Resources Committee, 2016). Also upon completion, the interconnectivity of the three regions and their internal linkages will be substantially improved, especially for Eastern SZ.

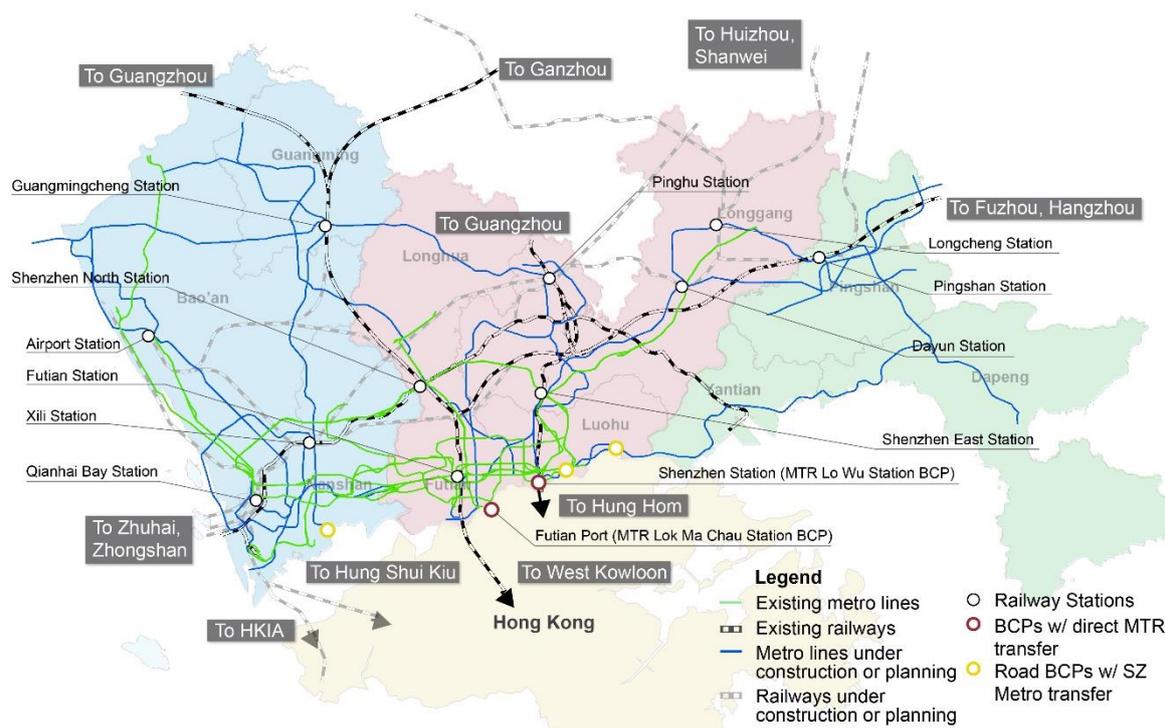


Figure 4.7 Railway system of SZ

Source: SZ Planning and Land Resources Committee, 2016; edited by Study Team

4.4.3. At present, the GZ-SZ-HK HSR and GZ-SZ Railway both pass by SZ North Station in Longhua and SZ Station in Luohu respectively, terminating in HK via HSR or East Rail of HK. This sets the foundation of collaboration between the two cities and GBA. SZ also has planned to extend the HSR network to Xili in Nanshan, Bao'an International Airport and Pingshan in the Eastern Region. In the future, the connectivity of SZ with neighboring cities, particularly HK and Huizhou, will be further strengthened with the construction of intercity rail. The proposed railway by SZ government passing through Qianhai to HKIA and HSK is intended to bring new development opportunity to the surrounding areas.

Strategic Transport Network in Western SZ

4.4.4. Western SZ is highly accessible to HK, especially to NTN with Futian BCP and Huanggang Superport by interchange to the metro links in the Central Region. Yet, there is currently lack of direct railway link connecting Western SZ to the western part of HK. With SZ's preliminary planning of future metro links that connect Qianhai with NWNT and HKIA, the region has great potential to strengthen its accessibility to HK. Thus, the flow of people between the key development nodes, such as Qianhai in Nanshan District, and the NDAs in NWNT, such as HSK, can be increasingly facilitated.

Strategic Transport Network in Central SZ

4.4.5. Central SZ is highly connected to HK due to the existing well-established railway network. With SZ's metro line 1 and 4, people can access conveniently to HK through Huanggang and Futian BCPs and transfer to the East Rail Line to NT in the direction of Hung Hom. Besides, with the operation of HSRL, the travel time from the CBD in Futian (Futian Station) and the advanced manufacturing base in Longhua (SZ North

Station) to WK in HK have been shortened to less than 20 minutes (Legislative Council, 2018).

Strategic Transport Network in Eastern SZ

- 4.4.6. The accessibility of Eastern SZ to HK is still in progress. The upcoming LT/HYW BCP and Eastern Cross-boundary Highway are intended to connect Hong Kong with the Eastern Cross-Boundary Highway.

4.5. Overall supporting policies in SZ

- 4.5.1. The success of the I&T industry in SZ is due to the government's favorable policies to work alongside with the spatial strategies (Table 4.7). Firstly, the responsible bureau for I&T development is granted with enormous power. The Shenzhen Technology and Innovation Committee has considerable power to formulate plans for the I&T sector, collaborate with high technology enterprises, manage funds and guide the management of tech parks and incubators.
- 4.5.2. Moreover, the government-led policies provide generous allowances and housing for talents, as well as subsidies for qualified enterprises. The government also further supports tertiary education institutions by funding and policy support to improve on the quality of R&D. International universities have set up sub-campus in SZ to improve on the research capabilities.
- 4.5.3. The SZ government also strives to enhance the cooperation and collaboration with HK in terms of I&T development. The Co-operation Agreement in the SZ/HK Innovation Circle Interactive Base enhances the interaction between both cities in the I&T sector, such as joint funding for R&D projects, as well as fostering the division of labor and specialization between HK and SZ (Development Bureau, 2008).

Table 4.7 I&T-related aspatial policies in SZ

Aspects		Supporting Policies
Institution		Shenzhen Technology and Innovation Committee <ul style="list-style-type: none"> Formulate policies and draft legislation on technology and innovation Manage funds for research projects Guide the management of tech parks
Policies for talents attraction	Talent programmes	Peacock Programme (\$987 MHKD in 2017) <ul style="list-style-type: none"> Focus on attracting high-level talents Distribute allowances for talents of different types (¥1,600,000-¥6,000,000)
	Living support	Provision of 300,000 units of talent housing during 13th five-year <ul style="list-style-type: none"> 60% of the market price for comparable units Subsidies of living and rent for newly introduced talents
Policies for education		<ul style="list-style-type: none"> Long-term objectives and timetable Provide a maximum of subsidy of ¥1B for each major university per year

Policies for enterprises	<ul style="list-style-type: none"> • Government-led • Provide a maximum of subsidy of ¥100 M for eligible groups and projects • Provide subsidies ranging from ¥0.3 M to ¥1 million for startups • Provide a maximum of subsidy of ¥3 M for an incubator
Policies for collaboration in I&T sector	<p>SZ/HK Innovation Circle</p> <ul style="list-style-type: none"> • Diversify funding modes for joint R&D projects • Permit funding for cross-boundary use

Source: ChinaDaily, 2018; SZ Municipal Government, 2011 and 2012; Du, 2017; Shenzhen Publishing Hall, 2018; Shenzhen Technology and Innovation Committee, 2018

Education and R&D

4.5.4. To foster the triple helix development model of university-industry-government, the municipal government takes the initiative to enhance the education in SZ (Table 4.8). The SZ government intends to strengthen the local universities, such as Shenzhen University, Southern University of Science and Technology, and more. The SZ government also invites foreign universities to set up sub-campus in SZ to strengthen the academic atmosphere within the city, such as Tsinghua-Berkeley Shenzhen Institute, CUHK-SZ, and SZ MSU-BIT University.

Table 4.8 Higher Education Institutes in districts of SZ

Region	District	Institutions	Background
Western Region	Nanshan	Shenzhen University	<ul style="list-style-type: none"> Local institution Comprehensive university Provide research platforms in the aspects of AI, big data, Biochemistry, Optimedia Technology Two campus located in Houhai and Xili
		Southern University of Science and Technology	<ul style="list-style-type: none"> Local institution Innovative University Provide innovative talents Provide platforms for fundamental research
		Harbin Engineering University (Shenzhen)	<ul style="list-style-type: none"> Local institution Provide research platforms in the aspect of Photoelectric information, Internet
		Shenzhen Polytechnic	<ul style="list-style-type: none"> Local institution Provide training on Electronics and Communication Engineering, computer
		Beijing University, Shenzhen Campus	<ul style="list-style-type: none"> Local institution Provide research platforms in the aspect of Chemical genomics, new material
		Tsinghua University, Shenzhen International Campus	<ul style="list-style-type: none"> Local institution Provide research platforms in the aspect of life science, energy
		Tsinghua-Berkeley Shenzhen Institute	<ul style="list-style-type: none"> Chinese-foreign cooperation Provide research platforms in the aspect of new energy, data and information technology
		Guangdong Xin'an Vocational Technical College	<ul style="list-style-type: none"> Local institution Provide training on Biotechnology computer
		Shenzhen Tourism College of Jinan University	<ul style="list-style-type: none"> Local institution Provide training on tourism management

	Guangming	Sun Yat-sen University Shenzhen Campus (under construction)	<ul style="list-style-type: none"> Local institution Belong to 985 programme and 211 programme Provide research platforms in the aspect of medical science, etc.
Central Region	Luohu	Shenzhen Open University	<ul style="list-style-type: none"> Local institution Provide adult higher education
	Longgang	CUHK-SZ	<ul style="list-style-type: none"> Chinese-foreign cooperation (including HK, Taiwan and Macao areas) Provide research platforms in the aspects of AI, big data, BioTech, etc.
		SZ MSU-BIT University	<ul style="list-style-type: none"> Chinese-foreign cooperation (Overseas) Provide training on new emerging technology
		SZ Institute of Information Technology	<ul style="list-style-type: none"> Local institution
	Longhua	Nankai University – SZ (under planning)	<ul style="list-style-type: none"> Local institution The first local higher education institution in Longhua District
Eastern Region	Pinshan	Shenzhen Technology University (under planning)	<ul style="list-style-type: none"> Local application-oriented institution Meet the needs of high-end industry Cultivate engineers and designers

Source: CUHK SZ, 2019; SZ MSU-BIT University, n.d.; SZ Institute of Information Technology, n.d.; University Town of Shenzhen, 2019; Shenzhen Education Bureau, 2019

4.5.5. In Western SZ, the University Town of SZ agglomerates most of the tertiary education institutions within the region, such as Shenzhen University, Southern University of Science and Technology and Beijing University, Shenzhen Campus. Almost all the higher education institutions in the Town are local institutions, with only one cooperating with overseas institution (Table 4.7). The R&D platforms in these institutions and the talent pool they generate build the capacity of innovation of the region. In addition, the SZ campus of Sun Yat-sen University under construction in Guangming will also enhance the development potential of I&T sector.

4.5.6. For the Central region, the SZ International University Park accommodates sub-campuses from national and international universities, including CUHK-SZ and SZ Moscow State University–Beijing Institute of Technology University (SZ MSU-BIT). Tertiary education is being developed in Longgang to provide more support on training and innovation research for the I&T sector (SZ Tequ Bao, 2016). Development of tertiary education and R&D are also planned in Futian, synergizing

with the proposed I&T development in the SZ-HK Technological Innovation Special Cooperation Zone in the LMCL area (Education Times, 2019).

- 4.5.7. Tertiary education in the Eastern SZ is developing in a slow pace, with only one university under planning in Pingshan. The planned university aims to cultivate technical talents for high-end industries and to promote the Go East Strategy.
- 4.5.8. However, there is still room for improvement for the development of education and R&D in SZ. Firstly, time is required to build and strengthen the reputation of universities in SZ in order to attract international talents. Most higher institutes are at their initial stages. Secondly, education and R&D industries in the city rely heavily upon government initiatives such as Chinese-foreign cooperation, to attract the foreign institutes and to set up branches in the region. Focus should also be put upon local institutes to utilize local knowledge and to establish a strong local identity of higher education and R&D. Last but not the least, the institutions in SZ are better at applied research while their capacity of fundamental research is comparatively weak, which generates the demand for closer collaboration between the SZ and HK in terms of education and R&D.

Talent Attraction

- 4.5.9. Talent attraction policies are introduced at the city and district levels. Their main objectives are to attract overseas talents and to train local talents, with a special focus of promoting growth in the I&T sector. “Peacock Programme” is a city-level policy aligning with the municipal government’s strategy to promote the high-tech industry. It aims to attract overseas top-tier talents by providing subsidies and funding for research projects and startups (SZ Tequ Bao, 2017). The SZ government also provides low-cost living space for young talents through preservation and renewal of urban villages (SZ Planning and Natural Resource Bureau, 2019). At the district level, each district governments provide rewards and recognition to talents through the form of talent programmes, including those in the I&T sector.
- 4.5.10. The supporting policies and institution for the I&T sector in SZ effectively stimulate the growth of I&T industry. Therefore, HK can further develop its policies as institutional support for developing the I&T sector. Some areas for further improvement include providing incentives for attracting talents and ensuring adequate management agencies for tech parks.

4.6. Key Takeaways of SZ Regions to HK

Overall SZ to HK

Diversify the economy

- 4.6.1. With the rapid growth of I&T development in SZ, HK should diversify its economy by promoting the local I&T sector and seizing this opportunity of regional collaboration. The current economy of HK relies heavily upon financial and service industries, which are proven to be highly susceptible to market fluctuations and external economic conditions. Not only can I&T sector help create a high-value added and diversified economy, it is also a sustainable growth source to the economy of a city. This may also address the problem of homogeneity in the economic structure and the lack of diverse job opportunities for young talents in HK.

- 4.6.2. Apart from emphasizing HK's role in innovation and design, prosperous advanced manufacturing and accelerating technology innovation in SZ also bring opportunities to promote re-industrialization in HK, in order to diversify HK's economy and industrial structures.

Capture the competitive advantages

- 4.6.3. As the two cities have distinctive roles to play in the I&T development, HK and SZ should capture their competitive advantage to complete the production chain at the regional level. Taking the comparative advantages of innovation and production in HK and SZ respectively, HK may focus on innovating specialized producer goods incorporating the latest high-tech innovation and design like robotics, in order to achieve complementary specialization with the I&T sector in SZ (Federation of HK Industries, 2016). For example, Longhua and Longgang are developing into mature advanced manufacturing base, whilst Futian and Luohu are positioned as the commercial service centers to commercialize the high-tech products. HK has a competitive advantage in high quality tertiary education and research institutions, hence it can serve as the innovation and knowledge hub in supporting R&D for the I&T sector in SZ and the wider GBA.
- 4.6.4. With different strengths in terms of research and education, the two cities should also enhance the level of cooperation and complementary effects in the education and research of the I&T sector to boost the innovation ecosystem. Building on top of the increasing number of universities in the university towns in SZ, continuous investment of resources and opportunities is necessary to ensure that the universities are more international and contributive to the I&T industry. HK's universities may leverage their advantages in tertiary education to enhance the application of academic and fundamental research through increasing cooperation with SZ's commercial I&T sector.
- 4.6.5. On the other hand, the advanced manufacturing base in SZ can provide vocational and skill-based training platform for HK's young talents, in order to promote their comprehensive understanding of the I&T sector, as well as different stages in the production chain.

Western SZ to HK

- 4.6.6. HK can further develop FinTech by collaborating with Qianhai, which is positioned as a major center for innovation and finance. To facilitate Qianhai's development, effective and relatively free flow of capital is needed to facilitate the collaboration between HK and SZ. This enables HK to grasp the opportunity of developing FinTech by cooperating with Qianhai.
- 4.6.7. With reference to Figure 4.4, the Western Axis passes by major existing I&T nodes, such as SZ Airport New Town and Qianhai. With the proposed motorway and intercity railway systems connecting Qianhai to NWNT (Figure 4.3), the cooperative potential in I&T sector is likely to increase. The conceptual linkages of Western SZ and HK would be strengthened. Moreover, NWNT has great potential to synergise with Western SZ and to develop I&T sector.

Central SZ to HK

- 4.6.8. As mentioned in Section 4.3, the Northern Economic Belt in HK has the potential to be further developed in promoting the I&T development. The recent plans of Futian and Luohu again prove and reveal their high development potentials.
- 4.6.9. With the development of Futian's Cooperation Corridor, the future land use of the surrounding NDAs in NTN can also be reviewed to facilitate the agglomeration for I&T development. Besides, Huanggang Superport is proposed to be a major transit hub for people and goods, the Superport will become one of the biggest BCPs to strengthen linkages between Huanggang and future NDAs in Northern HK.
- 4.6.10. The innovation and emerging industrial belt in Luohu indicates that the NTN new towns at HYW which are located near the innovation zone will have a great potential to synergise with the I&T production in SZ.

Eastern SZ to HK

- 4.6.11. Eastern SZ has a relatively strong BioTech base with a relatively high concentration of BioTech companies and research institutions. This can help to complement the Eastern Knowledge and Technology Corridor in HK. HK is also proposed to diversify its I&T industry with BioTech being one major sector. Complementary collaboration of the BioTech industry is possible between Eastern SZ and HK in this area.
- 4.6.12. As the PC/TKL/HYW area is located in close proximity to the LT/HYW BCP, it is likely to be developed into the future strategic transport hub connecting HK and Eastern SZ. Therefore, there is a need to review the plan of this area to capture the collaborative benefits with Eastern SZ, particularly in the field of BioTech.

5. Strategic Planning in HK in relation to I&T

5.1. Existing Strategies in HK2030+

- 5.1.1. In the HK2030+, the I&T sector is identified to be one of the growth sectors that the government is keen to develop. The choice of developing the I&T industry is due to HK's heavy reliance on the four pillar industries, and are proven to be exposed to great vulnerability and financial risks at times of financial instabilities. Therefore, the HK government aims to further develop the I&T sector to increase the health of the economic structure in Hong Kong. The policy suggestion of developing the I&T sector is emphasized in the second building block.
- 5.1.2. To analyze the existing condition of the I&T sector and provide an objective comparison between this emerging sector with the four pillar industries of HK, Industrial Cluster Analysis (ICA) is applied with reference to the method proposed by Stimson, et al. (2006). Six measures are chosen to compare the economic strength of I&T with the four pillar industries of HK. Among them, employment and the contribution to GDP can describe the scale of the industries, while their performance are demonstrated by rates of change in employment and contribution to GDP. Besides, annual average wage and its change rate are utilized to describe the value of the industry from the perspective of market.
- 5.1.3. The following two figures show the results of the analysis. Compared with trade and logistics (Figure 5.2), which is the largest industry among the five, I&T (Figure 5.1) is relatively smaller in scale, both in terms of contribution to GDP and employment size, whereas it has the potential to continue to grow for its prominent ranking of performance. The indicators of average wage show that the importance of the I&T sector in the market is still growing.
- 5.1.4. Last but not least, according to the computed strength index of the two sectors (34.7 and 31.3 respectively), the I&T industry is also a bit more growth oriented than trade and logistics industry.

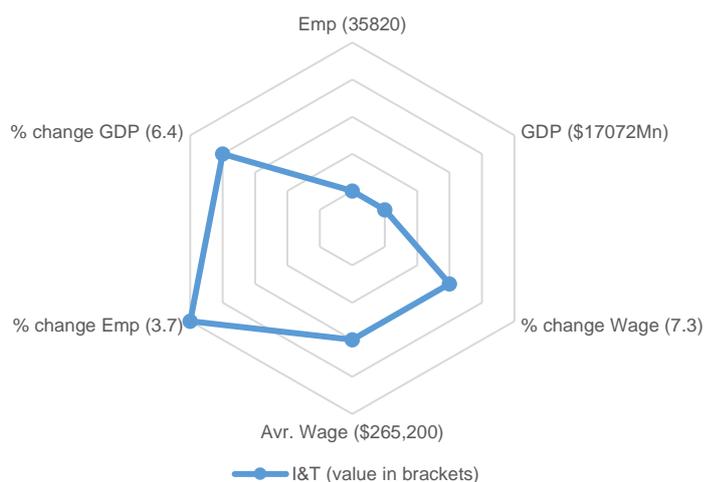


Figure 5.1 Spider diagram for the I&T cluster in HK
 Source: Census and Statistical Department of Hong Kong, 2015; 2018

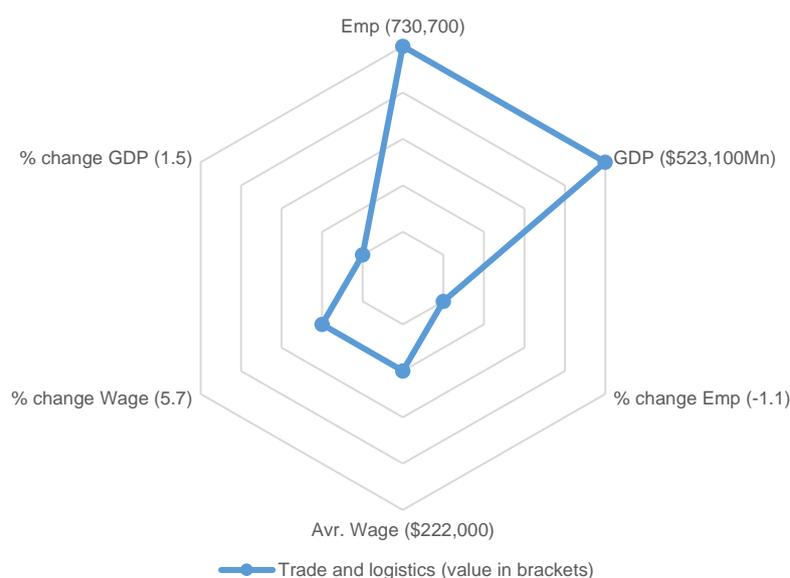


Figure 5.2 Spider diagram for the trade and logistics cluster in HK
Source: Census and Statistical Department of Hong Kong, 2015; 2018

Building Block 2 in HK2030+

- 5.1.5. I&T sector is one of the focuses in second building block in HK2030+, “Embracing New Economic Challenges and Opportunities”. Providing sufficient land to develop the I&T sector is the biggest challenge to enable the growth of the industry to be competitive worldwide. Diversifying the economy to I&T sector inevitably strengthen the resilience of HK’s economy and ensure sustainable growth. Therefore, suitable sites should be identified and efforts should be made to cater for stakeholders’ requirements from the I&T sector. With the rapid growth of the I&T sector in the nearby cities, developing the I&T can further enhance the competitive advantage and enable regional collaboration with other cities to complete the production chain.
- 5.1.6. HK has the highest GDP out of all cities in the GBA initiatives (GDP of US\$1.34 trillion) (Careem, 2018). However, the city is lagging behind in the I&T development, as supported in 2030+. It is essential for HK to grasp the opportunity to diversify its economic structure and maintain Hong Kong's leading role in GBA.
- 5.1.7. For instance, special industries, as identified in HK2030+, have unique requirements in terms of the location and operation. To develop the I&T sector, IEs were built with special specifications in their structures, in order to accommodate high-valued added I&T activities. As logistics is serving as an important role in HK’s economy, logistics industry should not be overlooked while developing I&T sector. Possible alternatives will be establishing centers for modern logistics to further integrate I&T to logistics industry. This also provides insights for this study on land use and transport planning.
- 5.1.8. Other than spatial planning, policy support is highly important in facilitating the growth of I&T sector. Modern industries, including advanced manufacturing, FinTech, modern logistics and other I&T-related emerging industries requires support from the Government, particularly Innovation and Technology Bureau. As planned in HK2030+, there will be future expansion and upgrade in the existing Tech Parks and

- IEs, flexible policies support is required to respond to the fast-changing-and-growing I&T sector.
- 5.1.9. With reference to HK2030+, I&T is the major driver of global economy in recent years, and city-region, as well as inter-industrial collaboration is crucial to create “Tech-ecosystem”, synergy and momentum to drive urban changes. I&T is inseparable from all industries and therefore suitable lands and transport networks will facilitate the cross-industrial collaboration between Government, diverse industries, and research institutions. In particular, due to the concentration of universities in the Eastern part of HK, connecting universities with future I&T nodes will help to enhance innovation, which is also a part of indispensable developmental needs from I&T sector. The study will provide inputs to HK2030+ to address this consideration.
- 5.1.10. Table 5.1 shows the overall picture about the recent I&T initiatives, however there is no detailed plan explaining how these initiatives are positioned in I&T development. Therefore, one of the issues that this study will overcome is to position future I&T nodes effectively, so as to create synergy within HK and with adjacent cities in the region.
- 5.1.11. As shown from table 5.1, HK’s I&T initiatives have the general trends of regional collaboration with SZ (LMCL), expansion of the existing facilities (InnoCell, Yuen Long Industrial Estate (YLIE)) and “re-industrialization” to update the existing IEs. Designated spaces for the I&T sectors are found in the upcoming NDAs (HSK and KTN) and BCP (LT/HYW BCP).

Table 5.1 Recent I&T infrastructure in HK

Recent I&T initiatives	Details	Latest position
HK-SZ Innovation and Technology Park (HSITP) in LMCL	<ul style="list-style-type: none"> As the super-connector between HK-SZ, LMCL, it aims to become the foundation for collaboration in R&D, higher education and C&C, as well as attracting SMEs to locate their business in the Parks Provision of 87-hectare land with 1.2 million m² GFA for I&T use 	Construction work in Phase 1 is expected to be completed by 2021, while Phase 2 is under detailed design study
InnoCell – Expansion of Science Park	<ul style="list-style-type: none"> Aiming to enhance the competitiveness of HKSTP through the provision of residential institutions-cum-ancillary offices for incubates Provision of 0.28-hectare site with maximum GFA of about 15,300m² 	Expected to be completed in 2021
“Re-industrialization” in Tseung Kwan O IE (TKOIE)	<ul style="list-style-type: none"> HKSTPC is constructing two new buildings in TKO IE, including Advanced Manufacturing Center (AMC) and Data Technology Hub (DT Hub) for Data Technology and telecommunication services Provision of 10.5 hectares with 130,000 m² GFA site in TKO IE 	Expected to be completed in 2022
Proposed Technology Park in KTN	<ul style="list-style-type: none"> Provision of 17.5-hectare sites for I&T, which are zoned “OU” annotated “Research and Development” or “Business and Technology Park” on OZP 	Land resumption and clearance are expected to be commenced in late 2019, while population intake is expected to start in 2023
HSK NDA	<ul style="list-style-type: none"> Provision of a 9-hectare site for I&T on OZP 	Construction work is not yet commenced
Expansion of HKSTPC in Yuen Long IE (YLIE) at Wang Chau	<ul style="list-style-type: none"> A long-term development plan of HKSTPC Provision of 15-hectare land 	Subject to further study
Liantang/Heung Yuen Wai (LT/HYW) BCP	<ul style="list-style-type: none"> Provision of a 56-hectare site for the development of an IE or Science Park 	Subject to further study

Source: Legislative Council, 2017; Legislative Council, 2017b; Legislative Council, 2018; Legislative Council, 2018a; Legislative Council, 2019; ITC, 2018

Development Axes

5.1.12. As discussed in Sectoral Study, HK2030+ suggested three development axes to guide the direction and areas of growth in HK (Figure 5.3) (Planning Department, 2016). The Eastern Knowledge and Technology Corridor comprises of tertiary

education institutions, tech parks and industrial estates (IEs). The Northern Economic Belt is envisioned to be the R&D agglomeration for the I&T sector due to the strategic location of the border region and the relatively high development potentials of existing land (ibid.). As for the Western Economic Belt, it aims to capitalize on the international and regional gateways with support of transport infrastructure in Western HK (ibid.).

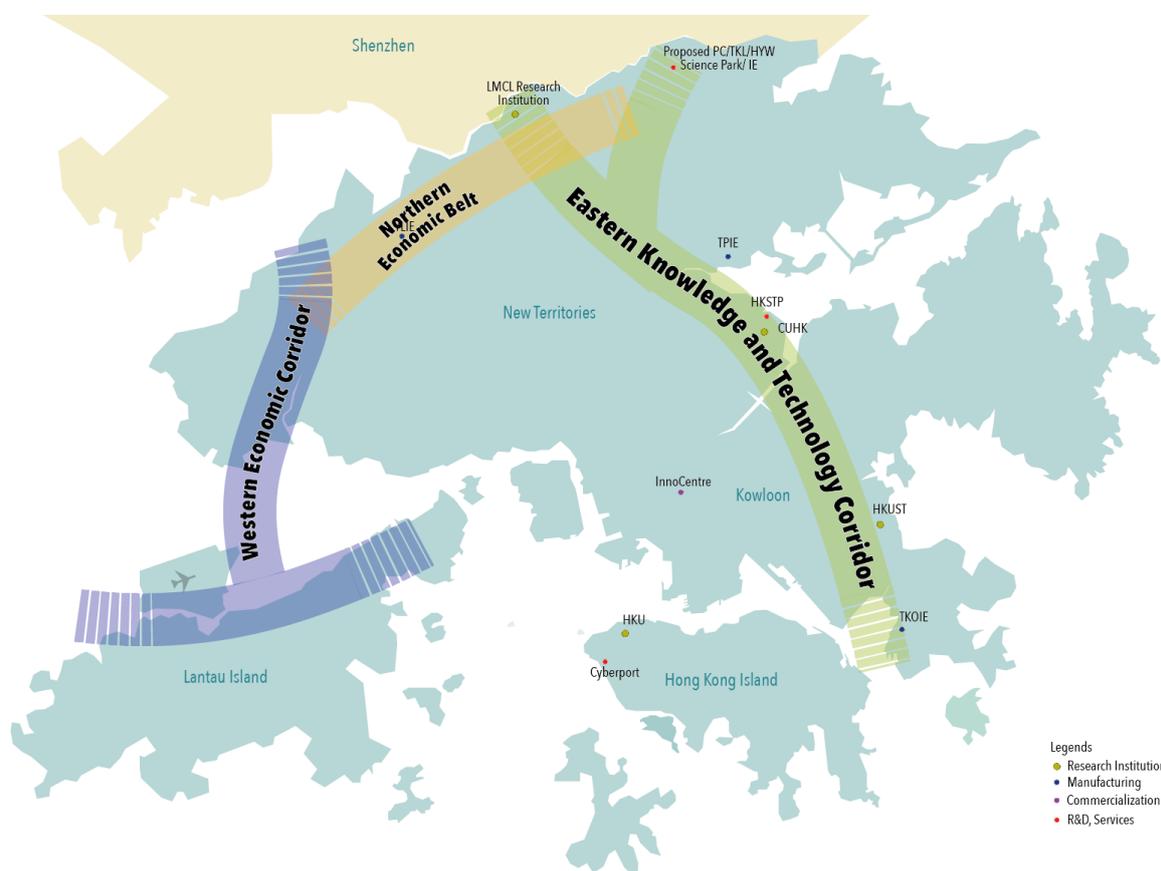


Figure 5.3 Spatial Development proposed in HK2030+
 Source: Planning Department, 2016

Possible spatial provision

Underutilized Brownfield in NTN

- 5.1.13. With the previous history of the Melhado case, NTN has an extensive stock of brownfield sites (Legislative Council, 2017d). These brownfield sites are mainly used for open storage and logistics warehouses. The brownfields are often contaminated when accommodating these industrial activities, which are usually low-value added operations that provide little job opportunities. Although the logistics industry has been an important industry in HK with a strong role in supporting the city’s economy, the dispersed location and the large amount of valuable land occupied by these operations have often led to high level of controversy, and extensive investigation have been made to analyze the potential for better utilization on these pre-occupied land.

5.1.14. Indeed, these brownfield sites have been further expanded to the North, and created challenges for resuming and clearing up these areas. As shown in Figure 5.4, the majority of HK's brownfields are concentrated in HSK, YLS, LMC, KTN, and Fanling North (FLN). Occupying these strategic locations that are in close proximity to SZ and well-established road network along the brownfield sites, there are huge opportunities to redevelop these sites. Some potential development include the introduction of space to accommodate high-value added activities, such as the I&T sector, which requires intensive collaboration with SZ for synergy effect.

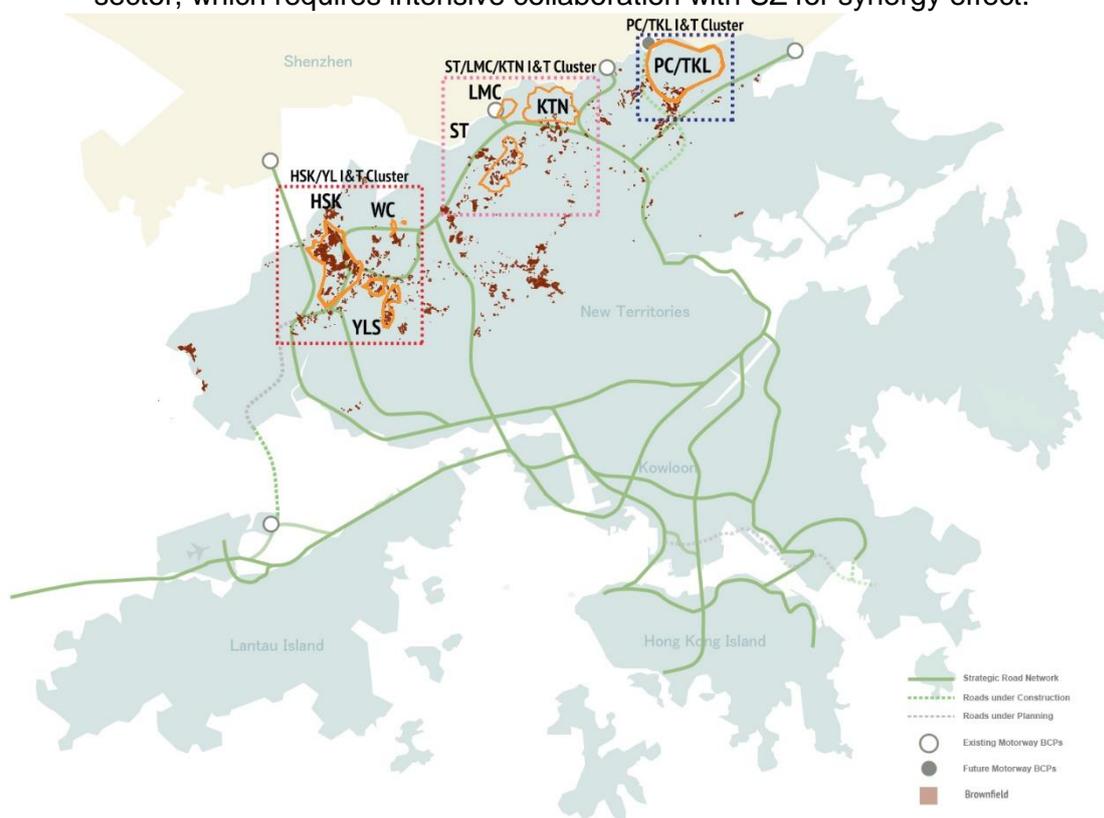


Figure 5.4 Distribution of brownfield land in HK
Source: Study Team

Possible reclamation

5.1.15. Different types of spaces should be provided for fulfilling the needs of the I&T sector. Other than the large clusters of brownfield sites at the border of SZ in NTN, spaces in the urban core with close proximity to the CBDs should be provided for commercialization purposes and for the FinTech industry. Locating financial services-related I&T industry in urban core can maximize the benefits of the cross-boundary collaboration and synergies with the industries for the I&T sector. Seeing the fact that there is inadequate land provision in urban core, reclamation is an alternative.

5.1.16. As discussed in HK2030+, ELM, which includes Kau Yi Chau as the only reclaimed site, will serve as a platform to develop FinTech within the One Metropolitan Circle. Taking the locational advantage with close proximity to Cyberport, HKU and CBDs, FinTech and financial services industries will enjoy mutual benefits of the close collaboration with each other. Therefore, reclaimed site will be considered as one of the sources of land provision for the I&T sector.

Underground space

- 5.1.17. Another new type of space created in the urban core is the underground space. Currently, a high level of congestion is being found at street level with dense pedestrian and traffic circulations that heavily reduce liveability. Therefore, the HK government conducted a pilot study in investigating the possibilities of underground space in creating and formulating new space in dense urban areas. This can help to provide prime locations for the I&T sector to commercialize their products, as commercialization space is one of the most lacking spaces in the production chain locally (CEDD, 2019).
- 5.1.18. There are three Strategic Urban Areas (SUAs) that were being selected by the HK government as sites for further investigation. These include: Tsim Sha Tsui (TST) West, Causeway Bay and Happy Valley, and Admiralty/Wan Chai. TST West is a strategic location as it is in close proximity to the High Speed Rail (HSR) terminus, which allows high level of accessibility to SZ, and can be strategic for the development of the I&T sector (CEDD, 2019).

5.2. Existing I&T facilities in HK

- 5.2.1. Existing tech parks have diverse functions in supporting the I&T industry. The two largest tech parks, including HKSTP and Cyberport, both aim at providing diverse facilities and services to accelerate I&T development and nurture start-ups in the I&T industry. They specialize in different fields but they share the similarity of developing the upper scopes of technology; whereas IEs, the focus of HK2030+, serve as a place for advanced manufacturing, such as Chinese medicine and precision assembly (Legislative Council, 2017).
- 5.2.2. Other than the existing tech parks located in Figure 5.3, Table 5.1 shows various recent I&T infrastructure projects in NDAs along the development axes in HK2030+, in order to grasp the potential in developing I&T sector (Legislative Council, 2017).
- 5.2.3. As I&T sector is emerging quickly, the government has allocated numerous sites in NT for I&T development. From HK2030+, the proposed NDAs have the strategic role to integrate with SZ by “appropriate land use and transport planning”, as well as “cross-boundary infrastructure planning”. From the establishment from recent I&T initiative, it is observed that the locations of Tech parks and IE are shifting north. Except for the extension of Science Park in TKO IE, the remaining initiatives are concentrated at the border region in NENT, which foster the I&T collaboration and exchange with SZ (Figure 5.5). The proximity to the boundary of SZ can increase the flow of I&T talents, knowledge, capital and technology.

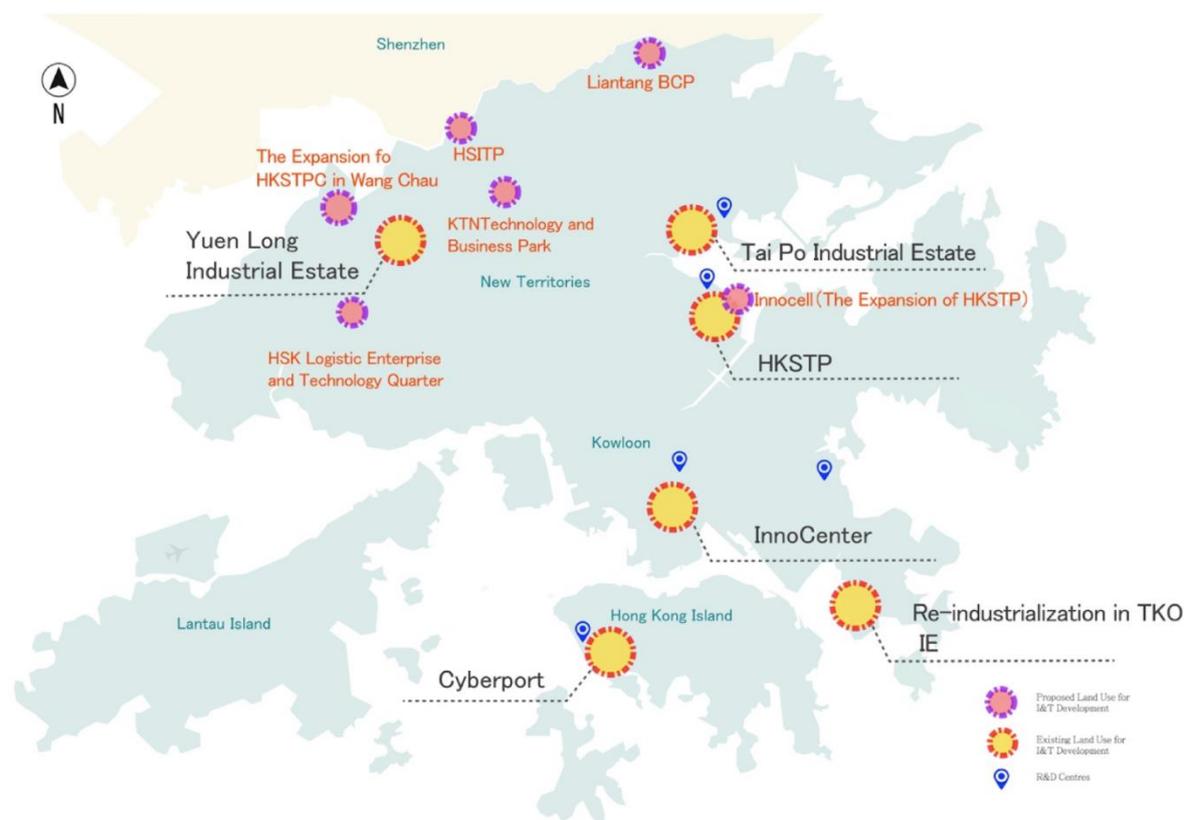


Figure 5.5 Proposed and existing land use for I&T sector
Source: Study Team

5.2.4. Technological infrastructure is the key in contributing to the success of the I&T sectoral development. Currently, HKSTP, InnoCenter, Cyberport and other IEs are the main infrastructures facilitated for I&T use in HK (Table 5.2).

5.2.5. Tech parks

5.2.5.1. The major tech parks in HK are HKSTP, InnoCenter and Cyberport. These I&T tech park specialize in different fields as shown in Table 5.2. HKSTP specializes in healthcare, science and engineering; InnoCenter for commercialization; Cyberport for Big Data and FinTech. Although these major I&T sites in Hong Kong specialize in different fields, they share the similarity of being in the upper scope of technology and are active in upstream market. However, the poor commercialization of these upstream research is a major downfall to the I&T sector development in these sites. This means that there is a low level of demand for these products in the local markets, leading to insufficient investment to be re-invested to enable a stable R&D platform to be developed. Therefore, connecting upstream and midstream research to downstream market, as well as commercializing the I&T products in the markets, are indispensable for ensuring the success of the I&T sector.

5.2.5.2. The location of tech parks is crucial in determining the possible level of connection of facilitating the I&T production chain. For example, TPIE can support HKSTP's by dispersing the production chain. However, the location of tech parks in HK is dispersed and may not meet the demand of the industry. In the Study, the Study Team has proposed strategic planning strategies in land uses and transport to facilitate I&T growth, and to provide inputs to the existing HK2030+.

Table 5.2 Comparison of existing tech parks in HK

Tech Park	Function	Field
HKSTP (22ha)	Provide variety of facilities and services for applied R&D activities, and a space for business services	<ul style="list-style-type: none"> • Biomedicine • Electronics • Green tech • ICT • Material/precision engineering
InnoCenter (0.1ha)	Provide office space for training and conference facilities, target group is for design companies	<ul style="list-style-type: none"> • Product design • Service design
Cyberport (6ha)	Accelerate the pace of digital adoption by nurturing start-up firms and entrepreneurs in the digital industry	<ul style="list-style-type: none"> • AI • Big Data, FinTech • Digital industries • Smart living

Source: Legislative Council, 2017

5.2.6. Industrial Estates (IEs)

5.2.6.1. IEs provide land and facilities for smart production, pharmaceutical healthcare, ICT, specialized manufacturing and so forth. Re-industrialization was suggested in HK2030+ to upgrade existing IEs. The IE policies aim to provide financial support and office spaces to the qualified high-end manufacturing operators (Constitutional and Mainland Affairs Bureau, 2019). Currently, there are 3 IEs in HK, including TPIE, YLIE and TKOIE. Table 5.3 illustrates the details and the current conditions of the three IEs.

Table 5.3 Comparison between 3 IEs in HK

Industrial Estates	Yuen Long IE	Tseung Kwan O IE	Tai Po IE
Major industries	<ul style="list-style-type: none"> • Pharmaceuticals and biomedical • Production • Logistics services • Petrochemical plant 	<ul style="list-style-type: none"> • Heavy industries • Lighter commercial manufacturing • IT/ICT-related services 	<ul style="list-style-type: none"> • Food manufacturing • Media services • Lifestyle goods
Occupancy rate	96%	98%	100%
Accessibility	<ul style="list-style-type: none"> • 5.5 km from HSK • 12 km from LMC BCP • Direct connection to Kai Tak Container Terminal 	2 km away from Lohas Park MTR Station	1.5 km from Tai Po town center

Source: HKSTP, 2019; Legislative Council, 2011

- 5.2.6.2. The three existing IEs specialize in different fields of I&T. TKO IE specializes more on heavy industry, TPIE in media service, and YLIE in biomedical, logistics services and more I&T-related sectors. This has supported that the YLIE is more suitable and possible to be developed into a testing ground for I&T products.
- 5.2.6.3. Among the three IEs, YLIE has the lowest occupancy rate. TKOIE and TPIE have the occupancy rates of 98% and 100% respectively, which undermine the possibility of the upgrading of TKOIE and TPIE to engage in the I&T-related production. This gives rise to a higher potential of YLIE in supporting the development of I&T sector.
- 5.2.6.4. Future expansion of IEs in NENT will create extra opportunities for advanced manufacturing in I&T sector by broadening middle to upper scope of technology. This enables innovators to produce and commercialize their products locally.
- 5.2.6.5. Although HK has positioned itself as an international financial center, the rapid growth in I&T sector and recent I&T initiatives have supported the government's determination in developing the sector. The sector is also intended to be developed at a regional level with GBA, which is envisioned to become "a hub of global technological innovation" (Constitutional and Mainland Affairs Bureau, 2019).

5.2.7. **Problems of the existing I&T facilities**

Non-functional complementary of existing I&T infrastructure

- 5.2.7.1. Existing I&T infrastructure in Hong Kong is unevenly distributed spatially with non-functional complementary purposes, which limits the growth of I&T sector. Figure 5.6 shows the functional distribution of I&T infrastructure, it can be summarized that manufacturing is concentrated in the northern part of HK, while R&D centers and tech parks are distributed in the middle part of HK, with only one I&T facility, InnoCell, is responsible for commercialization of I&T products.

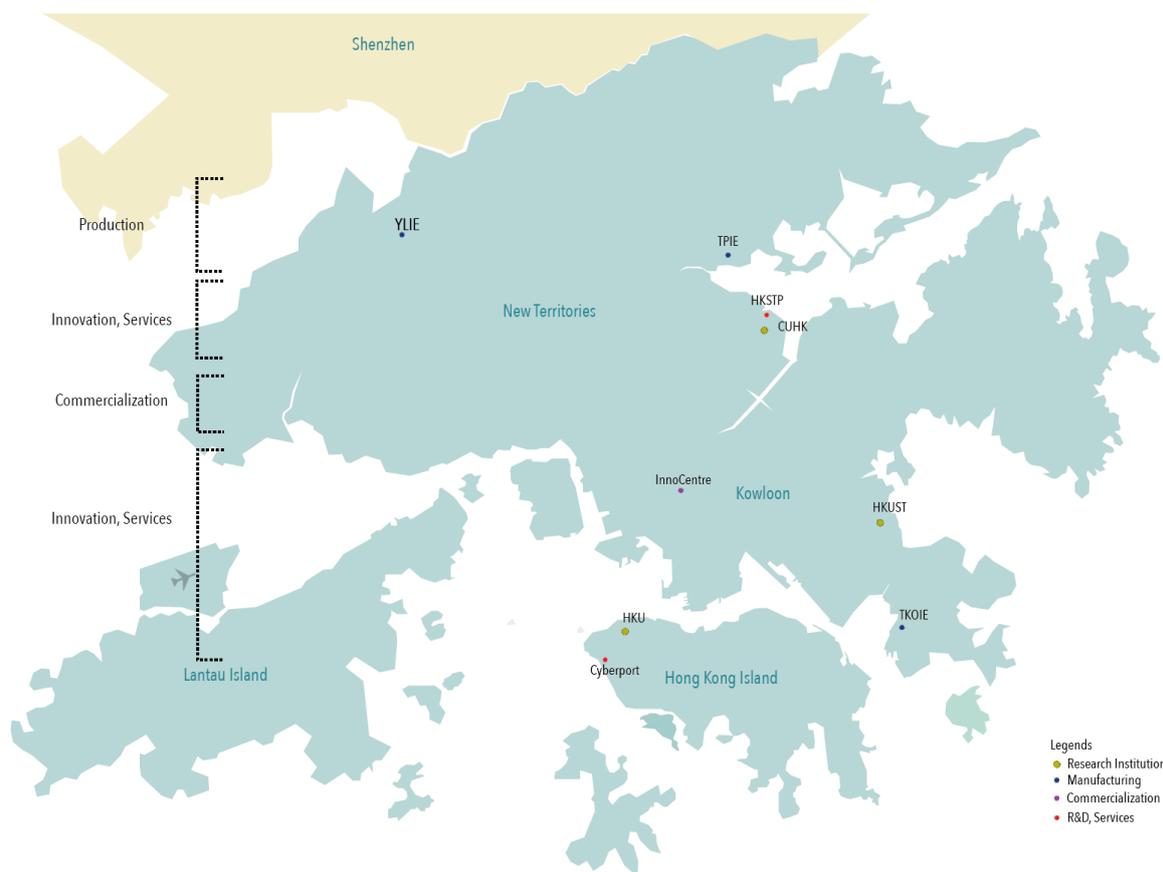


Figure 5.6 Analysis of existing I&T infrastructure
Source: Study Team

5.2.8. The existing I&T environment in HK does not have a complete production chain. Based on the infrastructure shown in Figure 5.6 and previous analysis on existing I&T development, HK is strong at innovation and services, whereas relatively weak at production and commercialization, due to the lack of space provision for corresponding functions. Therefore, future I&T nodes shall utilize its competitive advantage and consider the option of connecting the fragmented functions of production chain.

Lack of clustering

5.2.8.1. Discussed in previous chapter, clustering promotes agglomeration effect, which benefits the growth of I&T sector by integrating and completing production chain. The existing spatial distribution of I&T infrastructure is weak in clustering, i.e. only HKSTP and CUHK, Cyberport and HKU are being regarded as I&T clusters with proximate location of university to tech park. The remaining infrastructure is scattered, in which the potential growth areas have the potential to agglomerate the existing and proposed I&T facilities. This scattered distribution has reduced the ability for the I&T nodes to interact and synergize with each other.

5.3. The Existing I&T Ecosystem: Integrated Development Model

Government: ITB

- 5.3.1. I&T has been regarded as the driving force of economic growth and industrial competitiveness. Due to globalization and the emerging importance of the I&T sector, Innovation and Technology Bureau (ITB) was established in 2015 in formulating holistic I&T policies and hence fostering the development of I&T sector in HK.
- 5.3.2. The Innovation and Technology Commission (ITC) aims to create a vibrant ecosystem, and provide software and hardware supports for professionals on research, development and innovation activities (ITC, 2016). Meanwhile, ITC also works closely with other departments, tertiary institutes and the industrial and business sectors to promote R&D development and upgrade the basic industries.
- 5.3.3. To promote commercialization of R&D results and technology transfer, ICT set up five R&D Centers (ICT, 2005):
- Automotive Parts and Accessory Systems R&D Centre (APAS);
 - Hong Kong Applied Science and Technology Research Institute ("ASTRI");
 - Hong Kong Research Institute of Textiles and Apparel (HKRITA);
 - Logistics and Supply Chain MultiTech R&D Centre (LSCM);
 - Nano and Advanced Materials Institute (NAMI).
- 5.3.4. In the recent years, HK has made great achievements in I&T sector with growing demand. In 2017, the number of I&T related start-up companies has risen by 16% and the number of staff employed in these start-up companies has increased 21% (HTDC, 2018). In addition, the R&D capacities in the local universities of Hong Kong are recognized globally. The world-class financial center in Hong Kong has brought huge possibilities in developing BioTech, AI, smart city and financial technologies as the I&T focused areas in HK.
- 5.3.5. Due to the lack of private investment sources, most I&T projects are highly dependent on the government's funding. In 1999, the government set up the Innovation and Technology Fund (ITF) to encourage the development of innovative ideas and technology businesses (ICT, 2005). At the end of March 2016, a total of \$11 billion were approved for ITF. Most of the funded R&D projects were related to IT (27%); electrical and electronics (21%); manufacturing technology (18%); and BioTech (10%)(ibid.).
- 5.3.6. I&T research is divided into upper, middle, and lower scopes in Hong Kong and SZ. The local advantage of the excellent tertiary institutes enables HK to focus on the upper scope of research. Although the government is keen to provide a better condition for I&T development through issuing a series of policies, the lack of midstream and downstream markets makes it difficult for the commercialization of technology and products. The lack of commercialization of I&T products is a major shortfall of the industry.

Industry & University Collaboration

5.3.7. Currently, the collaboration between universities and industry is based upon their spatial locations and locational proximity. For example, more projects are found between HKU-Cyberport and CUHK-HKSTP. The collaboration operates in different forms, but are usually in the forms of shared spaces, networking platforms, facilities, and researches.

5.3.8. Table 5.4 lists some current university-industry initiatives in fulfilling part of the triple helix model. HKU and Cyberport share the facilities of the Cyberport campus for MBA students and networking platforms for FinTech companies. This is to agglomerate talents, whether from universities or companies, in establishing a large network for fostering the I&T development. As for CUHK, the university shared BioTech facilities, and the applications of smart city applications with innovations from HKSTP. CUHK is used as a testing ground for smart city initiatives. As for HKUST and HKSTP, which is connected via the Eastern Knowledge and Technology Corridor, share the researches in the Nano and Advanced Materials Institute. This is a research center supported by ITB, and is an example of a triple helix modelling collaboration in HK.

Table 5.4 Current Universities in Supporting the I&T Development and Facilities

University & I&T Facilities	Major Initiatives
HKU-Cyberport	<p><i>Cyberport Campus for MBA students</i></p> <ul style="list-style-type: none"> • Full-time MBA courses are held in the Cyberport campus <p><i>Fintech Nucleus</i></p> <ul style="list-style-type: none"> • Cyberport: cluster of Fintech startups and industries • HKU: provide professional services and consultancy of services for FinTech
CUHK-HKSTP	<p><i>Shared BioTech facilities 2</i></p> <ul style="list-style-type: none"> • CUHK and HKSTP enjoy shared advanced biotechnology facilities • Interaction between BioTech companies and start-ups to share facilities (industry) with CUHK in terms of biotech R&D (university) <p><i>Smart region living lab 4</i></p> <ul style="list-style-type: none"> • A collaboration between HKSTP and CUHK for pilot smart city applications in both campuses • HKSTP: “leading agent” for smart region initiatives for new technologies and commercialization for startups • CUHK: various faculties were involved in the smart region pilot projects (cashless society, autonomous driving, smart building and facility management)
HKUST-HKSTP	<p><i>The Nano and Advanced Materials Institute (NAMI)5</i></p> <ul style="list-style-type: none"> • NAMI of HKUST opened office and laboratories in HKSTP • To provide commercialization support for innovative products • R&D in nano and advanced materials • Products made with nanotechnology include: electronics, healthcare, energy and environmental products

Source: CUHK, 2010; Computer World HK, 2017; Cyberport, 2019; HKSTP, 2018; HKU Faculty of Business & Economics, 2019; HKU Media, 2017; HKUST, 2010

5.4. Potential development of the I&T industry

5.4.1. Diversify the I&T sectors

5.4.1.1. The main I&T industries to develop upon are Fintech, BioTech, Big Data/AI, Modern Logistics and Smart City. Table 5.5 shows the land use requirements and considerations for different I&T industries. FinTech has a stronger spatial requirement of office space in order to innovate and test their products. Particularly, Grade A office space, i.e. office space locating in the prime location of a city such as the CBD, is a notable location for high-profile, finance-related institutions and research centers, due to the proximity to customers and business (Intercity, 2019). As such, FinTech should be developed in the future I&T clusters, where prime locations for businesses are concentrated.

5.4.1.2. As for BioTech, the industry requires laboratories, and connections with the research institutions as it is heavily knowledge-based. For big data/AI, no specific spatial requirements are found as the industry mainly operates in the virtual platform. As for the upgrading of existing logistics and manufacturing, more land-intensive spaces, such as warehouses, IEs and logistics parks are required.

Table 5.5 Land use requirements and other considerations

I&T Industries	Land Use Requirements	Other Considerations
FinTech	<ul style="list-style-type: none"> ▪ Co-working space ▪ Innovation labs & accelerators ▪ Offices ▪ Warehouses ▪ Supplier units 	<ul style="list-style-type: none"> ▪ Regulatory sandboxes ▪ Business environment/ access to markets ▪ Government/regulatory support ▪ Access to capital ▪ Financial expertise
BioTech	<ul style="list-style-type: none"> ▪ Co-working space ▪ Laboratories ▪ Hospitals and science centres 	<ul style="list-style-type: none"> ▪ Prominent financial market ▪ Talent availability ▪ Responsive and innovative culture ▪ Research-focused infrastructure
Big Data/AI	No specific requirement as big data/AI promotes the ideal of virtual platform.	<ul style="list-style-type: none"> • Business and governmental initiatives • Telecommunication systems • Availability of data
Modern Logistics	<ul style="list-style-type: none"> • Logistic Park/Port/Airport • Warehouses • Highway/Railway/Office space 	<ul style="list-style-type: none"> • Customer service • Life-cycle support • E-Commerce
Advanced Manufacturing	IEs	<ul style="list-style-type: none"> • New materials

Source: Zong Guan Xian International Logistics, 2016; edited by Study Team

- 5.4.1.3. Different I&T industries are often interrelated. For example, the development of modern logistics contributes to more efficient use of IEs and promotes the development of advanced manufacturing. Therefore, to develop multiple industries in HK is of high importance in order to complement the growth of different I&T industries.
- 5.4.1.4. For some industries, such as Smart City and FinTech, aspatial support such as the assistance from the government plays a more important role for their establishments. In addition, since the good performance market is also the result of institutional management, the government's support will be much more crucial for the future I&T development in HK.
- 5.4.1.5. Also, the talent pool is one of the key factors to strengthen long-term I&T development. Therefore, Hong Kong should grasp its advantages in talent availability and access to international capital and market to both enhance its position as a mediator between mainland China and the global markets to develop the I&T sector.

5.4.2. Increased regional collaboration

City collaboration between HK and SZ

- 5.4.2.1. There is great integration potential between the I&T sector of HK and SZ. As shown in Table 7.1 and the above sections, HK focuses on upper scope of technology and its development is led by universities; whilst SZ focuses on the middle to low-end scope and its development is led by industries. These two cities can complement each other with HK as the innovation hub for fostering new technological ideas, whilst SZ manages the production of these technologies in relatively low costs and high efficiency.
- 5.4.2.2. The field of these two cities are also based upon their specialism and scope. HK is positioned as a renowned financial center and has a strong tertiary education system. The universities have high R&D capacities and work closely with FinTech and AI. SZ explores other fields of the emerging technological fields, such as energy, next generation I&T, and biology.
- 5.4.2.3. I&T sector in Hong Kong is still uprising, with a growing GDP contribution of 0.7 percent (Census and Statistical Department of Hong Kong, 2018). The city's income is still dominated by the four pillar industries as listed in Table 5.6. Aiming to diversify income sources to more sustainable sources, as well as coping with the regional opportunities of the GBA, HK is keen to further develop the I&T industry for it to become a major source of growth. The emerging industries of I&T in SZ are much more developed, contributing to 40 percent of its GDP, meaning that there are exchange potentials of expertise and complementary of industries.

Table 5.6 Comparison between existing I&T environment in HK and SZ

Indicators	Hong Kong	Shenzhen
Scope of technology	<ul style="list-style-type: none"> ▪ Upper scope ▪ University-led 	<ul style="list-style-type: none"> ▪ Middle-lower scope ▪ Industry-led
Field	<ul style="list-style-type: none"> ▪ Biotechnology ▪ Artificial Intelligence ▪ Smart City ▪ FinTech 	<ul style="list-style-type: none"> ▪ Biology ▪ Internet ▪ New energy/materials ▪ Culture & Creation ▪ Next generation I&T ▪ Energy saving and environmental protection
Contribution to GDP	<ul style="list-style-type: none"> ▪ 0.7% in GDP 	<ul style="list-style-type: none"> ▪ 7 emerging industries ▪ 40% in GDP in 2016 (There is no clear defined I&T sector in SZ. The statistics comes from the 7 I&T related industries.
Pillar industries	<ul style="list-style-type: none"> ▪ Financial services ▪ Trade & Logistics ▪ Tourism ▪ Professional services ▪ Producer services 	<ul style="list-style-type: none"> ▪ High-tech ▪ Modern Logistics ▪ Financial services ▪ Cultural activities

Source: Mok, 2016; Hong Kong Trade Development Council, 2018; Onag, 2016; Ho, 2018; Hong Kong Financial Services Development Council, 2017; Wong, 2014; Shenzhen Innovation and Technology Committee, 2017; Invest Shenzhen, 2017

5.4.3. Industrial Collaboration: Regional integration potentials between the HK & SZ I&T sector

- 5.4.3.1. In the “Outline Development Plan for the Guangdong-HK-Macao Greater Bay Area” (ODP for the Guangdong-HK-Macao GBA), the report highlights that the future growth trend is innovation-driven in order to cope with the global environment. The central government also observes the high R&D potential in SZ, HK and Macao. It is strategically identified as a focus industry to strengthen the socio-economic relationship between the cities, and to promote a long-term and stable source of economic growth.
- 5.4.3.2. Therefore, the government should facilitate the development of the I&T sector through supporting policies and appropriate land use. The government reviews its policy and provides investment funds to encourage start-ups and cross-boundary business activities. This is to ensure the freer flow of capital, labor and information between HK and Mainland China. Apart from specializing in different stages of the production chain, HK is much more engaged with the global I&T market, technical standard, and financial predictions (Legislative Council, 2017 and Constitutional and Mainland Affairs Bureau, 2019). The land use requirement of the I&T sector will be elaborated in the following.

5.5. Criteria for selection of I&T nodes

5.5.1. Transport Infrastructure & accessibility

5.5.1.1. Accessibility is one of the crucial attributes from the consideration of exchange of I&T elements such as talents, information and goods. Currently, there are two main types of accessibility that the Study Team focuses on, namely the pedestrian and railway network accessibility, and the motorized vehicle accessibility. Table 5.7 shows the influences of these two classifications of accessibility on the consideration for the selection of potential I&T nodes.

Table 5.7 Details of the two main classifications of accessibility

Types	Influences	Relations to potential I&T nodes
Pedestrian and railway network accessibility	Determine the level of accessibility for talents, as well as attractiveness for talents and economic opportunities	<ul style="list-style-type: none"> I&T nodes that involve a high degree of interaction will require high accessibility I&T nodes near NDAs need high accessibility
Accessibility of motorized vehicles	Affect the development of logistics and the roles in the production chain	Production based I&T nodes need high accessibility of motorized vehicles

Source: Study Team

5.5.1.2. As the collaboration with SZ is a major factor in driving development of I&T industries in HK, the efficiency and capacity of the corresponding BCPs should be examined carefully. BCPs are the direct access to SZ's boundary, and their permeability can influence the attractiveness and flow of cross-boundary talents and companies between the two cities.

5.5.2. Alignment with HK2030+

5.5.2.1. Potential I&T nodes should be aligned with the vision of HK2030+, particularly the employment opportunities along Northern Economic Belt. Currently, there is a mismatch between the number of employment opportunities for the population in NWNT and NENT, 1.1 M to 0.27 M in NWNT and 1.26 M to 0.4 M respectively (Table 5.8) (Planning Department, 2016). The mismatch of the population size and employment opportunities have intensified the spatial mismatch of jobs and homes, and resulted in long commuting time, expensive commuting costs, and various social issues.

Table 5.8 Number of population and jobs in NWNT and NENT in 2014

Area	Population	Employment Opportunities
NWNT	1.1M (15.2% ¹)	0.27M (7.2% ²)
NENT	1.26M (17.4% ¹)	0.4M (10.8% ²)

Source: HK2030+

Note¹: Population proportion to total population in HK

Note²: Proportion of employment opportunities to total employment opportunities in HK

5.5.3. Establishing I&T nodes in Northern and Western HK align with HK2030+ because a large number of both skilled and low-skilled workers will be required in the I&T cluster with integrated development. For instance, jobs provided for I&T talents, manufacturers, and service industries can provide substantial employment opportunities for the nearby communities. Northern and Western HK are also relatively underutilized, hence concentrating new development in the area is more likely to be feasible and effective in resolving the spatial mismatch of homes and jobs.

5.5.4. **Optimization of underutilized space**

5.5.4.1. Underutilized space refers to space which is not in its optimal use. Some of the underutilized space is characterized by the existing low-value added land use. One of the major sources of underutilized space in HK is brownfield. The brownfield sites are concentrated in NT, and are mapped out in Figure 5.7.

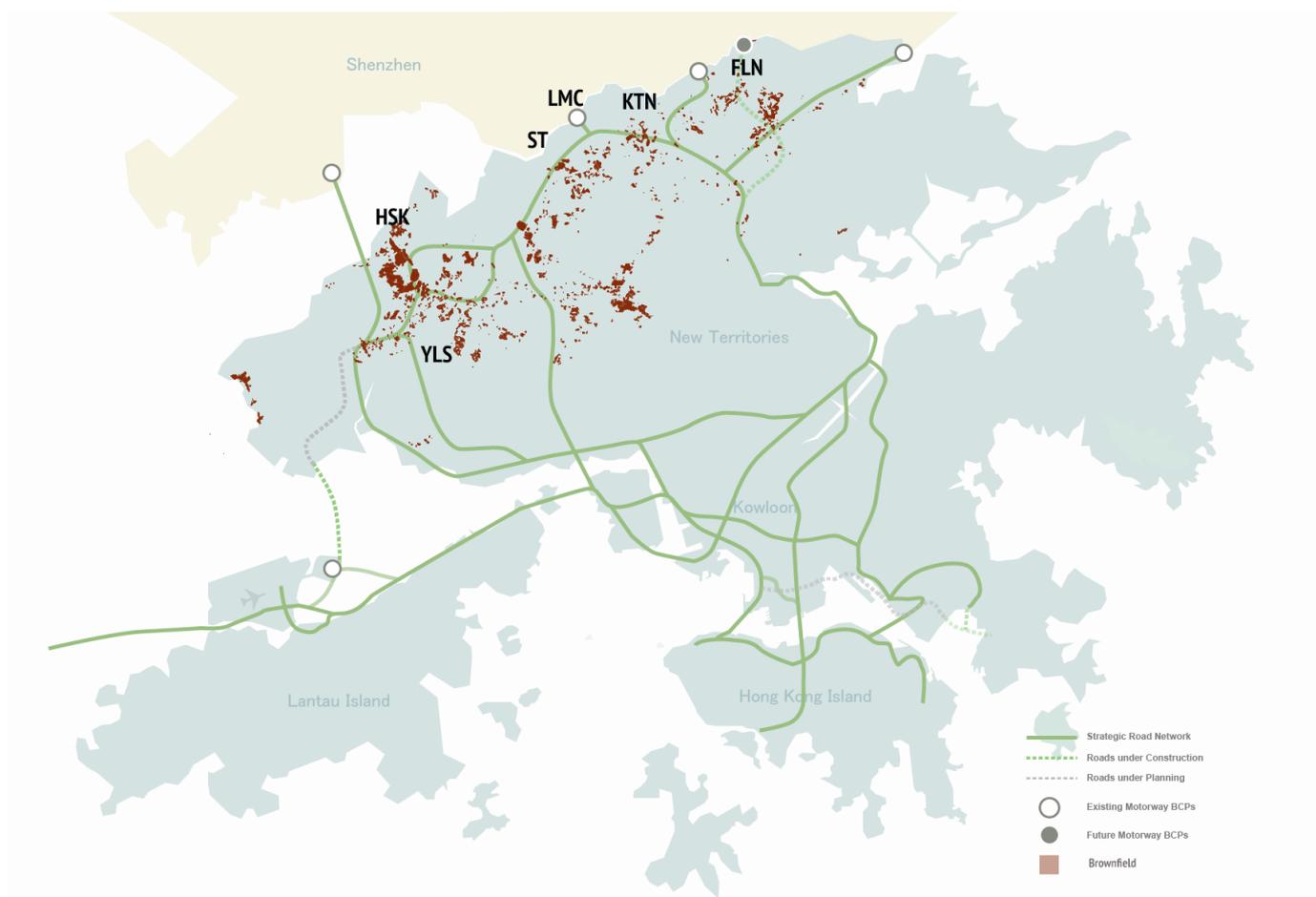


Figure 5.7 Spatial distribution of brownfield sites in HK
 Source: Development Bureau, 2018; Edited by Study Team

5.5.4.2. Most of the brownfield clusters are located in HSK, ST, KTN. Therefore, these areas are potential development areas as identified in HK2030+. Currently, ‘warehouse’ occupied the high proportion of brownfield sites. The brownfield sites currently accommodate low value-added economic activities and provides little employment opportunities to local residents (Task Force on Land Supply, 2017; DevB, 2019).

- 5.5.4.3. Better utilizing and relocating existing brownfield sites is one of the issues in HK's long-term planning, as brownfield is occupying large amount of valuable land in strategic location. The distribution of brownfield takes up land that is in close proximity to the SZ border. The vast amount of space that these brownfields provide can agglomerate different industries of the I&T sector for cross-industrial collaboration. For instance, AI and modern logistics, can be located in close proximity to apply the technology of AI to enhance modern logistics. Agglomerating the I&T industries require large amount of land space to develop synergy effect for further growth.
- 5.5.4.4. Moreover, there is a huge advantage in developing brownfield site into I&T nodes as supported by the convenient access to strategic road network as identified in Figure 5.5. Through repositioning these brownfield sites into potential growth areas, various economic, environmental and social benefits will be created. Some of the major benefits include eliminating negative externalities posed by brownfields to surrounding areas and natural life, and creating job opportunities and higher value-added economic activities. Developing the brownfields strategically can use HK's land more efficiently and develop NTN in an optimal manner.

5.5.5. Utilization of new types of spaces in urban core of HK

- 5.5.5.1. Valuable urban land with low value-added function refers to the land next to strategic transportation infrastructure, while having low value-added land uses or land uses that are not necessarily to be located in that particular location, i.e. community facilities and carparks.
- 5.5.5.2. At present, the urban areas of HK are densely developed and the available land for new development is very limited. In addition to the optimization of current space, to increase and utilize the land innovatively is necessary for I&T development as well. There are two proposed methods of land formulation, one is the reclamation and another one is the utilization of underground spaces. In 2011-12 Budget, the government allocate \$300 million for conducting relevant studies and public engagement exercise for increasing land supply by reclamation outside Victoria Harbor in order to meet HK's social and economic needs in the long run (Legco, 2011).
- 5.5.5.3. The proposal of increasing land supply by reclamation has been raised in 2011. Reclamation has long been regarded as a well-established method to generate more land to serve the social and economic development of HK. With the reference of Protection of the Harbor Ordinance (Cap. 531) in 1997, reclamation within Victoria Harbor to create new land is legally constrained whereas such constraint is not applicable to outside the Harbor, which makes it possible to increase land supply through the reclamation on an appropriate scale outside Victoria Harbor (Legislative Council, 2011).
- 5.5.5.4. However, according to the HK Geographic Data, about 500 to 700 ha of land was created by reclamation from 1985 to 2004 and the number has declined to 84 ha only in 2005 to 2009, suggesting that the capacity for reclamation is decreasing. The lower rate of reclamation can affect the land supply for housing and other uses in the coming years as reclamation is one of the major ways of land formation (Legislative Council, 2011). Therefore, it is of high importance to explore new ways of increase available land for accommodating the social and economic development in the long run.

- 5.5.5.5. The topographical setting with steep natural hillsides in HK limits the capacity of development. In the 2009-10 Policy Agenda, the Development Bureau has proposed a new initiative to promote the planning and development of underground space through strategic planning and technical research. Echoing with the new initiative, Civil Engineering and Development Department (CEDD), with the support of the Planning Department (PlanD), commissioned the above Study of the “Pilot Study on Underground Space Development in Selected Strategic Urban Areas” in 2016. The findings indicated that underground spaces in the urban areas are possible options to create new spaces in dense urban areas (CEDD, 2016).
- 5.5.5.6. Meanwhile, in HK2030+ and Task Force on Land Supply, the development direction of unlocking development potential by innovative land use, especially the underground spaces has been raised, in which, the exploration of new ways of utilizing the underground spaces so as to release the surface areas to increase development capacities has been emphasized.
- 5.5.5.7. In fact, HK has used underground space as a public and commercial facility for many years. Nevertheless, the majority of them relate to individual developments, such as the basement and carpark of shopping centres and the development of MTR stations (Press Releases, 2013). In order to strategically development underground spaces, new exploration is needed.
- 5.5.5.8. In the planning for the West Kowloon Cultural District (WKCD) and Kai Tak development area, the government has emphasized the utilization of underground spaces. According to the approved DP (Development Plan) of WKCD, the vehicular traffic and servicing facilities are proposed to be placed underground to create a pedestrian-friendly environment at the ground level so as to achieve the flexible utilization of underground space (LegCo, 2015) . While in the case of Kai Tak Development area, to enhance the community and cultural links, the government has proposed the development of two underground shopping streets (Hong Kong’s Information Services Department, 2017; Press Release, 2017). These two cases show the potential in developing HK’s underground spaces and to increase the available land for I&T development.

5.5.6. Satisfaction of the I&T industrial needs

- 5.5.6.1. As mentioned in Table 5.4, different I&T industries have specific needs. For example, the development of FinTech has specific requirements for its location, as a result, a majority of grade A office space should be prepared for supporting the development of the FinTech industry in the future. Compared to FinTech, developing BioTech relies less on a prime location. Instead, the locations of laboratories in developing BioTech may more ideal to be placed away from the city center for a quieter environment. Thus, to maximize the land value and promote I&T development, the selection of potential I&T nodes needs to meet the specific industry needs.

5.5.7. Linkages to relevant facilities

- 5.5.7.1. The selected potential I&T nodes should be well connected to the existing I&T-related facilities. The essence of triple helix model is the close connection between university, industry and government. Currently, the scattered I&T facilities in HK makes it difficult for each to utilize their strengths and build connections with each other to complete the production chain. Particularly, the current distribution cannot

utilize the strength in high quality tertiary education in HK, and to maximize collaboration with their corresponding industries.

- 5.5.7.2. Therefore, the selection of I&T nodes should focus on enhancing the working relationship between I&T nodes and universities so as to establish and expand the relevant talent pool. Meanwhile, the locations of I&T nodes should be in close proximity to the testing ground in order to speed up the commercialization process of research outcomes.

5.6. Opportunities and Challenges (SWOT) of I&T Development in HK

- 5.6.1. The strengths and areas for improvements of I&T development in HK are listed in Table 5.9 to understand HK’s comparative advantages in the regional and global contexts, and factors that limit the development of this industry. These strengths and areas for improvement are interlinked with the opportunities and threats of I&T development in HK. The recommendations aim to maximize and capitalize upon the opportunities identified, as well as tackling with the potential threats to maximize the effectiveness of the I&T development in HK.

Table 5.9 SWOT of I&T development in Hong Kong

Strengths	<ul style="list-style-type: none"> • Prime location at global and regional contexts • Credible legal and financial system • Free market, low tax rate • Judicial independence, little government intervention; Free flow of information and knowledge • Well-developed transport infrastructure • Internationally recognized tertiary education system
Areas for improvement	<ul style="list-style-type: none"> • Little incentive for attracting talents • Inadequate favorable policies and supporting infrastructures • Homogenous economy heavily relying on four pillar industries

Opportunities	<p>Competitive advantage in the completion of the production chain</p> <ul style="list-style-type: none"> Encourage completion of production chain domestically, by allocating appropriate land resources in strategic location <p>Growing trend of cross-boundary collaboration with mainland and the world</p> <ul style="list-style-type: none"> Integration of local market with regional market, attract potential customers and talents Enhance the connection of I&T products to global and regional market with strategic transport network <p>Diversify and strengthen I&T sector with existing strengths</p> <ul style="list-style-type: none"> Opportunity in developing FinTech on the basis on strong financial and legal system Further enhance the importance of BioTech and FinTech as the major I&T subsector <p>Potential collaboration between industry, research institutions and government</p> <ul style="list-style-type: none"> Promote triple helix model in developing I&T sector by connecting industries-universities-government within and between clusters <p>Strategic location of underutilized space for the I&T sector</p> <ul style="list-style-type: none"> Brownfield sites in NT, reclaimed land and underground spaces in urban core areas have development potentials for I&T the sector
Potential Threats	<ul style="list-style-type: none"> Uncertainties in the management of I&T sector Uncertainties in attracting talents to move to Northern HK

Source: Study Team

Strengths

- 5.6.2. HK has its locational advantage in global and regional context and has been providing credible and stable legal and financial system, which fosters superior and sound environment for I&T development and related business growth. Low tax rate, free market, judicial independence with little government intervention have facilitated the influx of talents, and free flow of information, which creates an attractive business environment. The well-developed transport infrastructure has also contributed to the positioning of HK as the connector between regional and global markets, which further increases the importance of HK in the GBA context. Aiming at a sustainable I&T growth, HK is renowned with its internationally recognized tertiary education system. The high quality talents and researchers can provide valuable input and innovations for the I&T sector. The strong tertiary education system also proves the universities' strong abilities to foster and train talents. With all these strengths, HK has attracted diversified I&T industries to start their business in Cyberport and HKSTP, as well as Multinational Corporations from GBA to establish their branches, so as to get better connection with the globe. As such, these strengths have favored HK to strategically plan for the extensive growth of I&T sector in order to promote sustainable economic growth.

Areas for Improvement

- 5.6.3. Although HK has its own competitive advantages, the development of the I&T sector is lagging behind compared to the other cities in GBA. There is room for improvement

- in terms of existing I&T environment in HK so as to become a more conducive and favorable environment for long-term I&T growth. Due to the little incentive for attracting talents, I&T growth has been deterred in the past few decades.
- 5.6.4. Moreover, the inadequate favorable policies and supporting infrastructure on talent attraction and the completion of production chain deter enterprises to further produce and develop their products locally. As such, the testing, production and commercialization stages for I&T sector are lagging behind, which requires more effort to grasp the opportunities brought by GBA initiatives and existing strengths to boost I&T development.
- 5.6.5. Apart from this, the current over-reliance on four pillar industries which is subject to high level of vulnerability and volatility, which reveals the need of HK to explore new market and diversify its economy with the I&T sector.

Opportunities

- 5.6.6. In light of developing I&T sector, the economy of HK will be greatly enhanced and become more sustainable with various opportunities to encourage growth in HK. Firstly, the competitive advantage of HK will be better utilized and strengthened with the completion of production chain. By encouraging the completion of production chain within the boundary of HK and with the city-region of HK and SZ, and the appropriate allocation of land resources in strategic location and transportation network, the capacity for innovation will be expanded and other stages in the production chain can be developed. The development in I&T sector will also create complementary effect with SZ due to their complementary nature of competitive advantages (as discussed in Chapter 4). The positive corporation will avoid vicious competition and create mutual benefits for both cities. This enables HK to better position itself in the GBA with its competitive advantages in the innovation and education system, connection to global market, as well as its sound financial and legal system to safeguard the growth and development of the I&T sector.
- 5.6.7. There is a potential for HK to diversify and strengthen existing I&T sector to the major sectors of BioTech and FinTech. There is currently a mature medical and health-care education system in CUHK and HKUST, with a strong institutional support to relevant R&D centers. There is a potential synergy between HK and Eastern SZ base on BioTech development, thus HK has its potential to further develop BioTech.
- 5.6.8. There is also an opportunity in developing FinTech on the basis on strong financial and legal system. With the well-established and sound financial system in HK, this has further enhanced the importance of FinTech as one of the major I&T industries in HK. There is a huge opportunity for testing and applying FinTech directly in the financial institutions in CBD1, CBD2 and future ELM as CBD3. SZ has its strength in Business-to-Client services in FinTech development, utilizing HK's strength in big data and financial foundation (Table 5.10).

Table 5.10 Comparison between HK and SZ on FinTech and BioTech

I&T Industries	Hong Kong	Shenzhen
FinTech	<ul style="list-style-type: none"> • Strong, well-established financial and legal system • Big Data to support FinTech development 	<ul style="list-style-type: none"> • Strong in Business-to-Client services • Strong connection with regional market
BioTech	<ul style="list-style-type: none"> • Mature medical and health-care education • Strong Institutional support to R&D 	<ul style="list-style-type: none"> • Strong BioTech base in Eastern SZ

Source: Study Team

- 5.6.9. Besides, seeing the growing trend of cross-boundary collaboration with adjacent cities and the world, there is an opportunity for HK to utilize the strategic location of locating at the boundary of mainland China, which favors cross-boundary collaboration for further I&T development. The integration of local market with regional market will attract more potential customers and talents from Mainland and global markets. The strategic location of HK with its strong strategic transport network with other parts of the world will enhance the connection of I&T production to global and regional markets, which makes HK suitable and of higher potential for developing I&T sector.
- 5.6.10. Moreover, with the strong institutional support in developing I&T, there is potential to collaborate between stakeholders. As mentioned in the previous sections, the application of the triple helix model to integrate collaborations between the industry, universities, and government. This interaction between stakeholders can synergize I&T development, resulting in better support of I&T development with response to market needs, and to further facilitate the maturity of the I&T sector.
- 5.6.11. The existing underutilized spaces in the strategic locations have high development potentials for developing the I&T sector and in favor of the collaboration with SZ. Logistics and warehouse operation in NTN, which are commonly found in brownfield land, as well as potential development of underground space in WK have established high development potentials for establishing new I&T nodes, which will also favor collaboration with SZ with strategic transport network and proximity to various BCPs.

Potential Threats

- 5.6.12. There are uncertainties in the management of future I&T facilities, as well as in the actual attractiveness of NTN to I&T talents. As the NTN has great development potentials, the spaces allocated for the I&T sector will be in greater scales than Cyberport and Science Park, and require strong management agencies to execute policies and ensure growth. Agencies are important to collect and utilize the funds allocated by the government, establish working relationships with universities, and attract companies to locate within the new clusters.

- 5.6.13. Due to the preliminary planning for NENT, the sector and talents have little information about the future I&T nodes, which may lower the incentives of establishing facilities by I&T enterprises or start-ups. In addition, the current I&t sites and development are concentrated in HK Island (HKU and Cyberport) and Ma Liu Shui (CUHK and HKSTP). It remains uncertain about the willingness of talents to move their work base to NTN, which is relatively distant from the existing I&T nodes. As such, it is crucial for government to formulate favorable policies promptly to support and encourage the sector to set up their firms and sub-campuses in the future tech parks. The proposed strategic plan aims at minimizing the potential threats when developing I&T sector.

6. Vision statement and planning principles

6.1. Vision

- 6.1.1. The overarching goal of this Study is to formulate appropriate recommendations to provide input by updating and enriching our current strategic planning framework and strategy, in order to enhance the sustainable growth and development of HK. Take into account the analysis in Section 5.6, it is identified that Hong Kong should develop and thus further enhance its I&T sector by making use of its competitive advantages in the regional and global contexts, so as to reduce its economic risks, enhance livability, and complement the development of other sectors.
- 6.1.2. Therefore, the vision of the proposed spatial planning strategy has been derived as: **“To strengthen Hong Kong's position as an international gateway by facilitating the regional collaboration with Shenzhen and other cities in the GBA, as well as enhancing capacity for sustainable economic growth of the I&T sector.”**

6.2. Planning Principles

- 6.2.1. The following guiding principles formulated the foundation for the proposed conceptual spatial framework in supplementing HK2030+:
- **Allocate suitable land for forming I&T clusters to complete production chain of I&T development;**
 - **Improve strategic transport network between existing and potential I&T nodes in Hong Kong, as well as with Shenzhen's key I&T-related areas;**
 - **Ensure effective and prompt actualization of proposed conceptual spatial strategy through favorable government policies.**
- 6.2.2. To strengthen Hong Kong's position as an important and economically powerful global city and gateway to the world and mainland China, Hong Kong needs to have long-term strategic planning that is guided by overarching strategic vision and planning directions. Through the above sections of reviewing the strategic planning of SZ and HK in particular focus on I&T sector, the input to the HK2030+ from this paper should supplement the Building Block 2 of HK2030+ in further enhancing the spatial strategies and supporting policies for I&T sector which will be put forward in Chapter 7.

7. Spatial strategies & Aspatial policies

7.1. Key Actions

- 7.1.1. Having a strategic location in GBA and being an international gateway, Hong Kong has locational advantages in developing the I&T sector. Together with the strengths of the sound and well-established legal and financial systems, as well as the opportunities of completing stages along the production chain of I&T sector with regional collaboration with SZ, developing the I&T sector can lead to more sustainable economic benefits to Hong Kong.

To form new I&T clusters in the strategic location of Hong Kong to synergize with Shenzhen and international markets

- 7.1.2. The current I&T development in HK is rather lagging behind with disconnection between their functions and positioning. It results in the low level of synergy with the rapidly emerging I&T hub in SZ. Thus, there is a growing demand that HK should work with SZ in complementing each other's growth in the I&T sector so as to increase their overall competitiveness.
- 7.1.3. The proposed planning principles also encourage the formulation of new I&T clusters. There is high demand for formulating new I&T clusters so as to respond to the above weaknesses that current I&T sector encounter. Targeting at utilizing the strategic locations in Northern HK and CBD and diversifying the job distribution of Hong Kong, establishing new I&T clusters in HK can help intensify the collaboration between HK and SZ through supporting the cross-boundary I&T collaboration with established legal and financial services.
- 7.1.4. Developing in the form of clusters can make use of the integrated development model, i.e. university, industry, government, as suggested in Chapter 3. In maximizing the benefits of locating educational institutions nearby I&T industries with the incentive provided by the government, it is believed that the ecosystem for I&T sector can be developed and thus can further attract traditional I&T firms and start-ups to set up companies and their branches in HK, strengthened with academic support from universities and efficient I&T infrastructure.

To introduce a completed production chain within and beyond the cluster

- 7.1.5. The incompleteness of the production chain within the HK boundary has resulted in ineffective production, commercialization, and promotion of the I&T products from HK to the regional and international markets. Therefore, the second key action is to complete the production chain within the boundary of Hong Kong and regionally with SZ. Some clusters can fulfil the production chain within the cluster of new development areas and IEs, while some will perform certain stages in the production chain. Through strengthening the Eastern Knowledge and Technology Corridor, and modifying two new development axes from HK2030+, the linkage and collaboration between the existing and newly-constructed I&T nodes can be strengthened and connected in a more holistic manner.

To leverage competitive advantages of FinTech and diversify I&T industries of Hong Kong

- 7.1.6. HK has an internationally sound and competitive financial industry. With the supplement of I&T-related services and software development, FinTech can continue to be one of the key I&T specialism in HK. The future development of WK, ELM, and HSK should differ their development modes from the traditional financial centers of HK. These new strategic areas should provide spaces for technological advanced financial-related industries, such as FinTech. At the same time, HK should not only focus on the development of FinTech as the sole I&T industry, but to encourage the diversification of I&T industries so as to leverage the competitive advantages of HK. For instance, I&T industries like BioTech, AI, Smart City, can also be developed with the support of the existing tertiary education institutions and companies. The I&T industry should be supported through the provision of developable land, as well as railway and road transport linkages to other parts of HK and the SZ. Aspatial policies should work alongside with these spatial strategies, for example, offering government incentives in attracting I&T firms, to ensure that the spatial strategies can perform to their full extent.
- 7.1.7. The above three key actions correspond to the planning principles of this Study and support the proposed spatial strategies on I&T sector on the foundation of the traditional strengths of Hong Kong in high quality tertiary education and reliable legal and financial services.

7.2. Overview of Proposed Conceptual Spatial Strategy

- 7.2.1. Figure 7.1 presents the overall proposed conceptual spatial framework, which is modified with the basis of HK2030+. With the guidance of key actions, the conceptual spatial strategies are suggested to be actualized in strategic locations in both peripheral and central part of HK. Four clusters (四群) are proposed and conceptually connected with three development axes (三軸). The proposed conceptual spatial strategies can be structured into four sections. Firstly, key actions are identified based on the vision for development, thus the conceptual spatial strategies (三軸四群) are proposed. To connect the four clusters to existing and proposed I&T nodes and urban area, strategic transport network is then proposed subsequently. The existing supporting policies are reviewed and further enhanced for implementation. Finally, key takeaways to main stakeholders in the development of I&T sector are analyze.

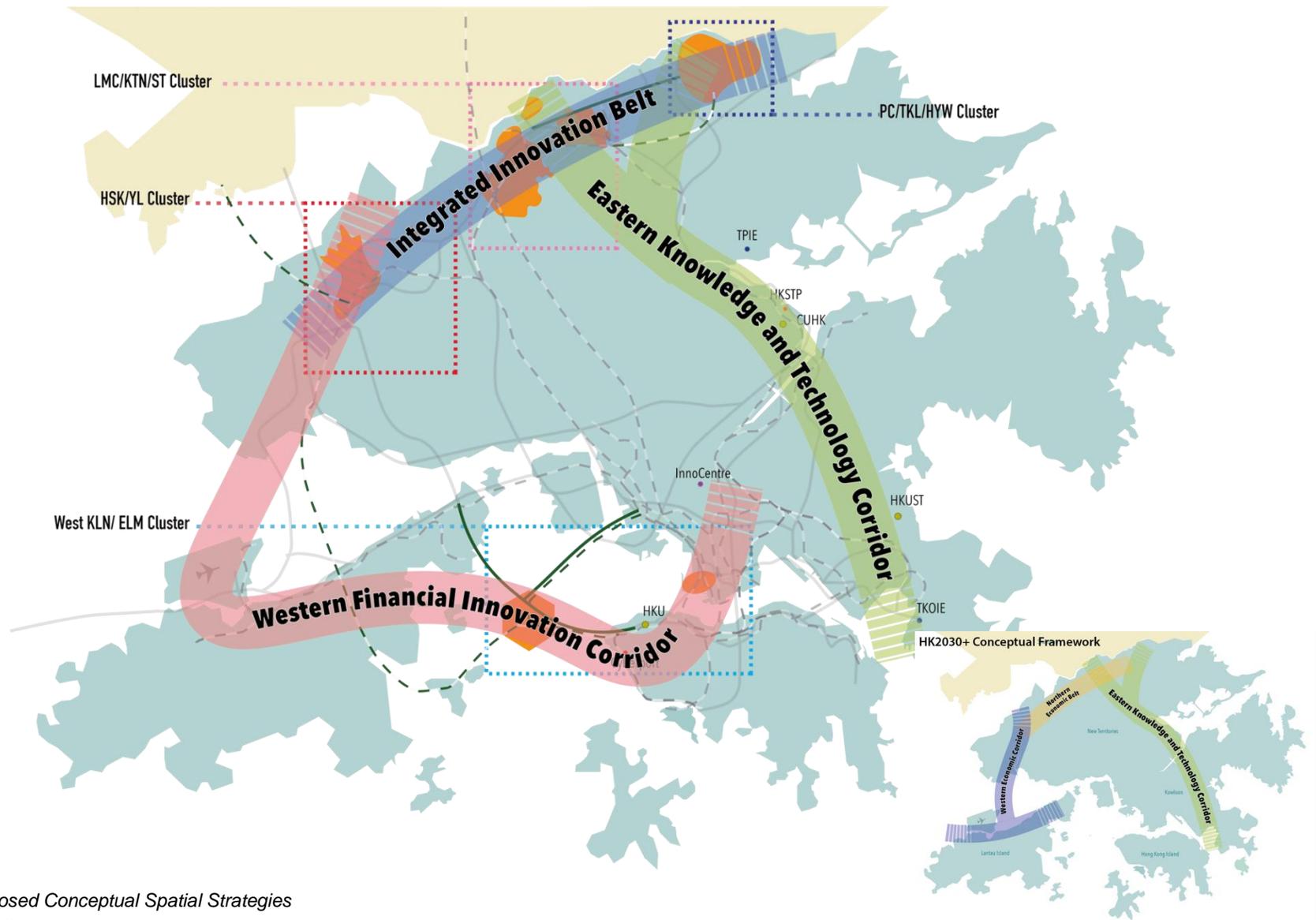


Figure 7.1 Proposed Conceptual Spatial Strategies
Source: Study Team

- 7.2.2. Based on the previous accessibility and land use analysis, and building on the HK2030+, three clusters in NTN and one cluster in One Metropolitan Area are proposed. The purpose of forming I&T clusters is to capture the benefits from agglomeration effect, which has been explained in Chapter 3.
- 7.2.3. The three development axes proposed are modified from the HK2030+ as shown in Figure 7.1. Features of the I&T development are integrated in the naming of the development axes, and the Western Financial Innovation Corridor is extended to WK.

7.3. The Four Proposed Clusters

- 7.3.1. The four proposed strategic I&T clusters allocate land for with different sectors of I&T, hence serve different purposes to achieve the overall vision. Three clusters are located in NTN in order the develop NTN with triple helix model and fill in the existing gap in I&T production chain. As for the cluster located in the urban area, it is to bridge HKI and Lantau by creating a new CBD with FinTech. The four proposed strategic I&T clusters have distinctive identities in creating a healthy I&T ecosystem for sustainable economic growth.
- 7.3.2. The four proposed strategic I&T clusters include (Figure 7.2) :
- HSK/YL Cluster
 - LMC/ST/KTN Cluster
 - PC/TKL/HYW Cluster
 - WK/ELM Cluster

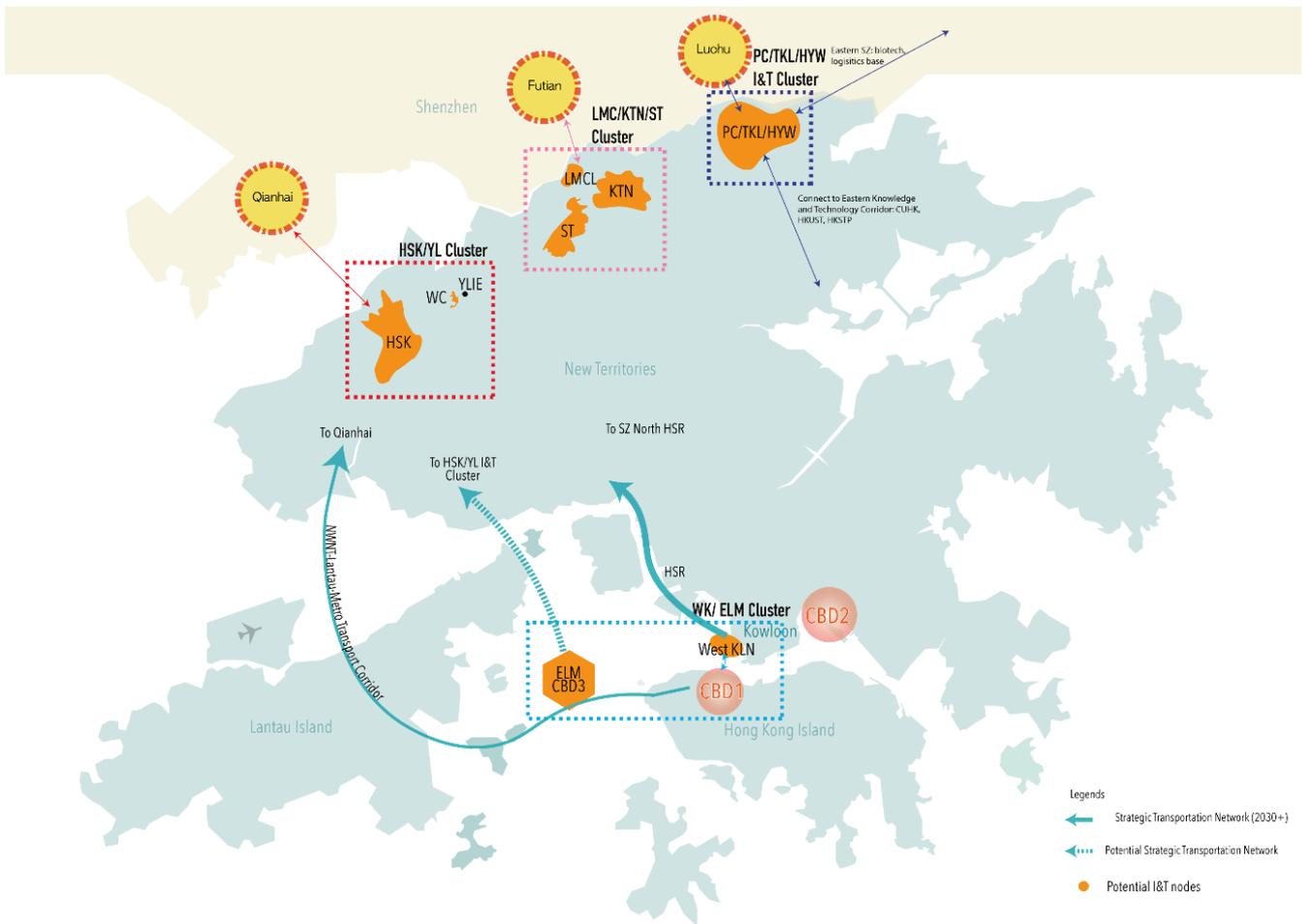


Figure 7.2 Proposed I&T clusters
Source: Study Team

HSK/YL Cluster

7.3.3. Vision for this cluster: To provide space for diverse I&T industries in the form of MSBs to increase the optimization of brownfield land, as well as envisioning the cluster to have the most **completed production chain**.

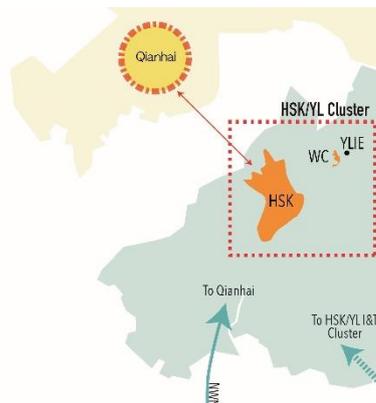


Figure 7.3 HSK/YL Cluster Spatial Interactions Within Cluster & Qianhai
Source: Study Team

7.3.4. As shown in Figure 7.3, the HSK/YL Cluster includes the sub-clusters of HSK, YLIE, and Wang Chau (WC). HSK has one of the largest stocks of brownfields as mentioned in Chapter 5 with great development potentials for R&D and MSBs to optimize the land for brownfield operations. YLIE is identified in Chapter 5 to be the existing IE to have the highest development potential with the lowest occupancy rate. It can be re-industrialized into advanced manufacturing and to become the testing ground for smart production. As for WC, in order to support the proposed uses of HSK and YLIE, WC can be developed into a business/enterprise park to accommodate diverse range of I&T industries (Table 7.1).

Table 7.1 Functions of sub-clusters in the HSK/YL Cluster

Sub-Cluster	HSK	YLIE	WC
Main uses	R&D; MSBs	IEs	Business/enterprise park; talent communities
Major industries	Logistics; fintech, smart living & AI	Advanced manufacturing; testing ground for smart production	Diverse but specialize in product design, biotech, smart production, smart living and AI
Role(s) in the production chain	Innovation; testing; commercialization	Production	Service

Source: Study Team

High Accessibility: Geographical proximity to Qianhai

7.3.5. This cluster has a great potential to become a future important I&T node in HK with strong accessibility linkages with Nanshan District and Futian District due to the Shenzhen Bay Bridge and the potential Shenzhen West Railway that will link HSK to Qianhai (Figure 7.4). The two districts are among the most economically productive in Shenzhen. Nanshan is a leading center of I&T industries and emerging industries while Futian is a mature CBD and commercial center that is also diversifying into technology-intensive industries. I&T development in the HSK/YL Cluster will be able to capitalize on the regional agglomeration effect with Nanshan and Futian Districts. Opportunities should be explored to locate I&T activities that complement Nanshan and Futian’s high-value-added R&D, commercialization services, start-up economy and headquarters economy in HSK/YL. In addition, the Cluster can possibly link to Bao’an International Airport with the future improvement in the transport linkages. Therefore, it has the potential to further connect with the regional and domestic markets in order to capture their benefits for I&T development.

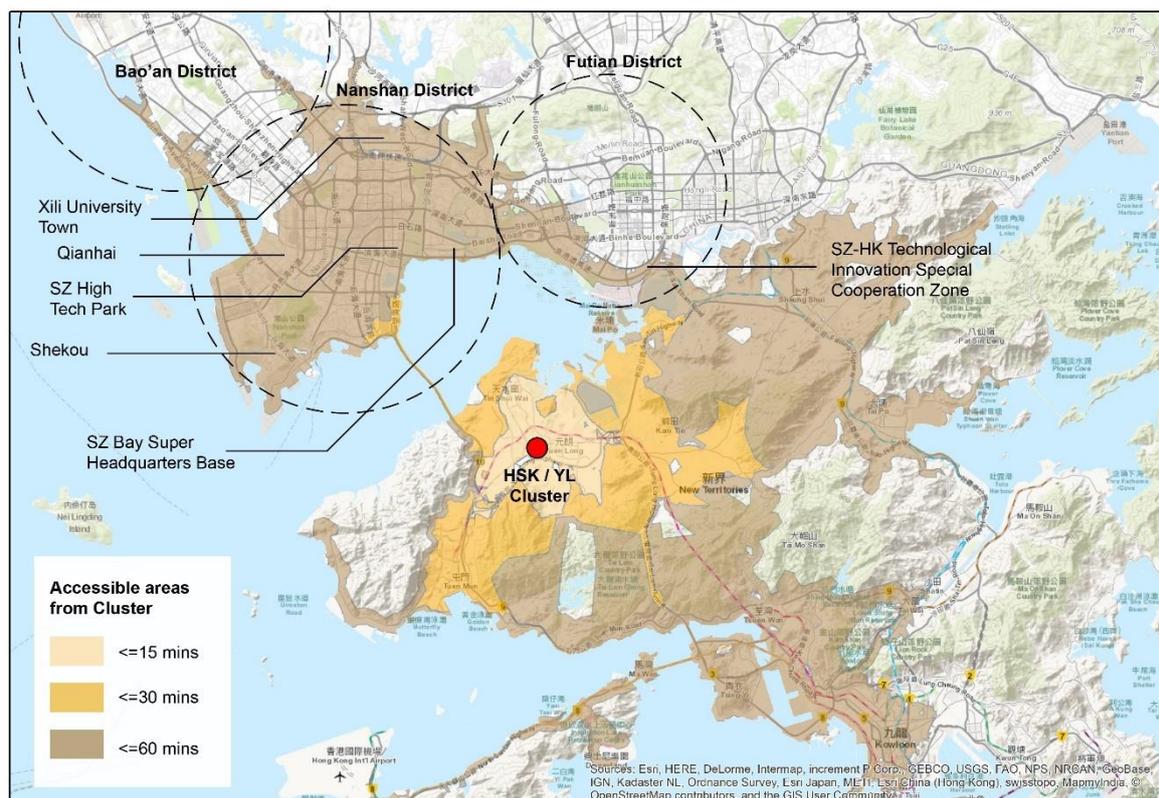


Figure 7.4 1-hour accessible areas in SZ from HSK/YL Cluster by motor vehicles
Source: Study Team

Alignment with HK2030+: Intersection of the Northern Economic Belt and Western Economic Corridor

7.3.6. The cluster is located at the intersection of the Northern Economic Belt and the Western Economic Corridor (Figure 7.5). With this strategic location, HSK is intended to become the future “regional economic and civic hub for the NWNT” (PlanD, 2015). It will grow into a transport hub connecting to SZ, such as Qianhai, Shekou, and Kong Sham Western Highway. The positioning of Qianhai can be refer to Chapter 4.2. HSK also has the possibility of connecting to Tuen Mun/Chek Lap Kok Link (TM-CLKL) to HKIA, and Hong Kong-Zhuhai-Macao Bridge (HZMB). It is also a major employment hub that can accommodate intensification of economic activities in NTN, as well as providing major sources of new job opportunities (PlanD, 2015).

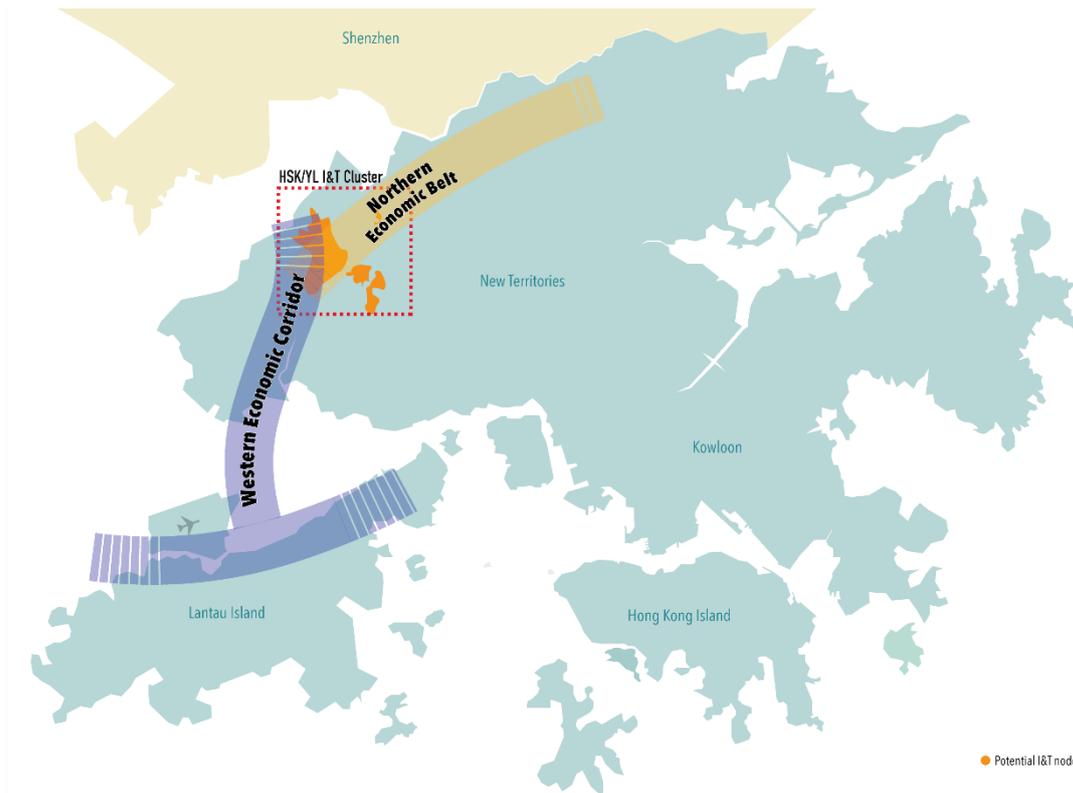


Figure 7.5 HSK/YL Cluster located at the intersection of the Western Economic Corridor and Northern Economic Belt

Source: Study Team

Optimization of brownfield land

7.3.7. The brownfields are currently underutilized with a flexible nature of sizeable land and being ready-for-use. This existing condition favors the nature of innovation as a fast-changing industry and poses fewer constraints in creating a large scale I&T agglomeration in built-up areas (Figure 5.5). Therefore, HSK and WC have high potential to reposition themselves as the future I&T hub, given that they are predominantly rural and underdeveloped in nature (Table 7.2 and 7.3). HSK accommodates the main land use of small houses and brownfield sites, which have further development potentials (Table 7.2). The major activities in HSK are land intensive, such as storage and logistics (Table 7.3). These uses have potentials for further intensification to release land for the I&T sector.

Table 7.2 Existing land use in HSK/YL Cluster

Wang Chau	HSK
Brownfields	Small houses and Brownfield site

Source: PlanD & CEDD, 2013

Table 7.3 Information on brownfields in HSK/YL Cluster

Potential Growth Area	Total developable area	Area of brownfield sites	Major operations
HSK	441 ha	190 ha	<ul style="list-style-type: none"> • Container storage, warehouses (49%) • Logistics (15%) • Open storage (14%)

Source: Task Force on Land Supply, 2017; Development Bureau, 2019

Ideal site conditions for the I&T sector: Completion of production chain

7.3.8. Having the concept of developing diverse I&T industries with the focus on modern logistics and FinTech, as well as advanced manufacturing in YLIE to support the ecosystem, HSK/YL Cluster has the identity of a completed production chain. HSK/YL Cluster is intended to contain the most completed production chain out of the four proposed clusters.

7.3.9. Through comprehensive planning and efficient use of brownfield sites, developing this cluster together with existing YLIE and proposed expansion of HKSTPC to WC, a complete production chain will be formed. To be specific, HSK will be the growth area for development of FinTech and modern logistics, while YLIE serves as the platform for advanced manufacturing, i.e. smart production, and WC will be for future I&T and R&D office space. Modern industries and the I&T sector will develop gradually at the boundary location to collaborate with mainland China. This cluster is characterized by its diverse and mixed community, which favors sustainable growth for I&T sector.

Linkages to relevant facilities: Warehouses & testing grounds

7.3.10. The existing logistics and warehouses operation on brownfield sites serve as opportunities for testing out I&T innovations, such as AI and smart production. Moreover, with the potential strategic transport connection from CBD and Qianhai to NTN, it provides new platform for leveraging development potential of HSK with FinTech.

LMC/KTN/ST Cluster

7.3.11. Vision for this cluster: To accommodate diverse I&T industries with a special focus on **smart city and AI**, characterized by the **triple helix model** with a **new university** intended to be built in LMCL.

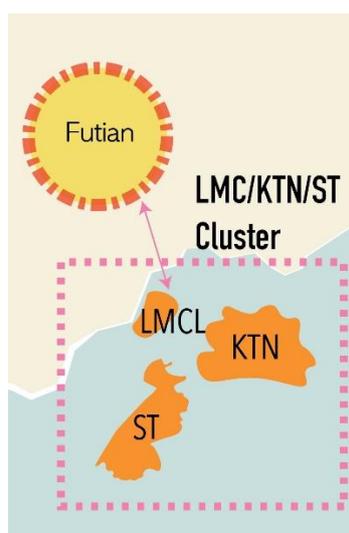


Figure 7.6 LMC/KTN/ST Cluster Spatial Interactions Within Cluster & Qianhai
Source: Study Team

7.3.12. As shown in Figure 7.6, the LMC/KTN/ST Cluster includes the sub-clusters of LMC, KTN, and ST. ST has one of the largest stocks of brownfields as mentioned in Chapter 5.5 with great development potentials for IEs, R&D, MSBs, to optimize the land for brownfield operations. As LMC is intended to be allocated for a new tertiary education institution campus, the proposed university can have their production and R&D spaces in the ST IE (Table 7.4). According to the updated OZP, KTN is zoned for business/enterprise park, and residential uses for accommodating talent communities. The business/enterprise park can accommodate diverse I&T industries to perform the innovation and service stages in the production. With the proposed university, and vast amount of industrial spaces proposed, the cluster is intended to develop with the triple helix model.

Table 7.4 Functions of sub-clusters in the LMC/KTN/ST Cluster

Sub-Cluster	LMCL	ST	KTN
Main uses	Tertiary education; R&D	IEs; R&D; MSBs	Business/enterprise park; talent communities
Major industries	Smart City; AI	Diverse but specialize in logistics, smart city and AI	Diverse
Role(s) in the production chain	Innovation	Testing & commercialization	Innovation & service

Source: Study Team

High Accessibility to the LMC BCP & Futian BCP

7.3.13. The areas along or in close distance to the proposed Northern Economic Belt (Kwu Tung, ST, LMC, Ngau Tam Mei, Kam Tin) will be highly accessible via both walking plus railway and driving. Furthermore, transforming the underutilized brownfield land into I&T or non-polluting supportive industries is possible based on their existing logistic accessibility by driving. In HK2030+, ST and LMC are together considered as one development node due to the proximity to LMC BCP (Figure 7.7). It is

currently one of the most heavily used BCPs with the direct link of the local transit MTR in both HK and SZ. Therefore, its strategic location to Futian BCP and high accessibility by various modes of transport have given the cluster strategic importance for developing the I&T sector.

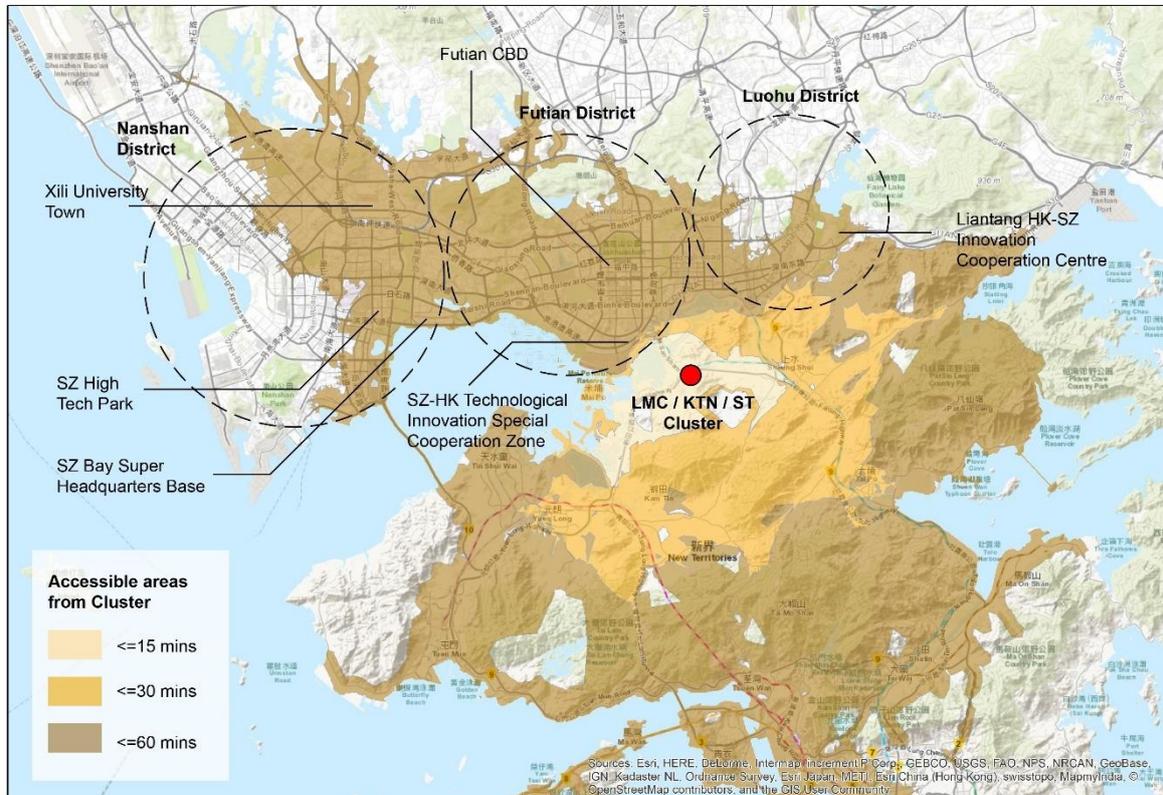


Figure 7.7 1-hour accessible areas in SZ from LMC/KTN/ST Cluster by motor vehicles
Source: Study Team

7.3.14. This cluster has strong accessibility linkages with Nanshan, Futian and Luohu Districts. Due to the cluster's proximity to LMC Station on East Rail Line and the proposed KTN and ST Station, railway transit to Futian and Luohu Districts is also highly convenient (Figure 7.8). This will further facilitate the flow of passengers and workers in this cluster. Therefore, this cluster has a spatial advantage in fostering potential cross-boundary knowledge exchange and creating a large regional cluster with SZ.

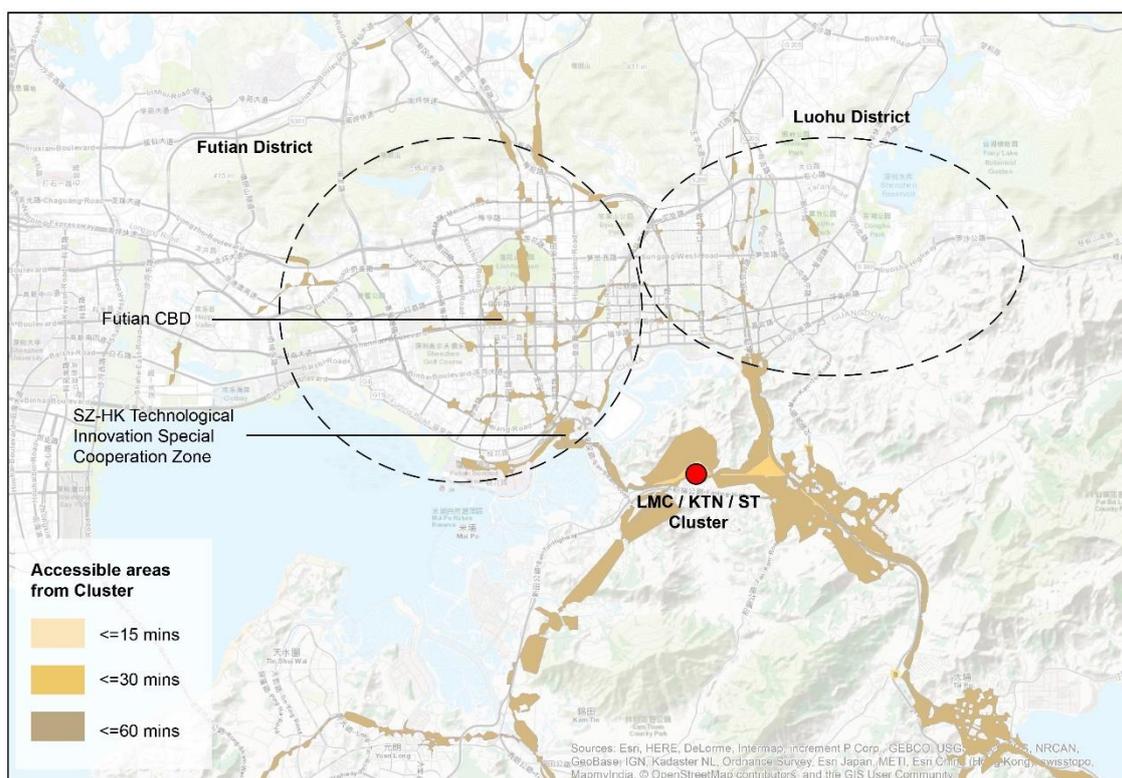


Figure 7.8 1-hour accessible areas in SZ from LMC/KTN/ST Cluster by railway transit and walking
Source: Study Team

7.3.15. The cluster is located adjacent to the proposed SZ-HK Technological Innovation Special Cooperation Zone. Therefore, this cluster enjoys great opportunities for regional collaboration of I&T development between HK and SZ. Both Futian and Luohu are mature commercial and finance centers, hence can develop triple helix model in this cluster by providing commercialization and services for the R&D in LMC. Furthermore, Futian and Luohu are also planning for diversification in their economy by investing in software, finance and services based I&T economic activities. Opportunities can be explored to locate I&T activities that complement Futian and Luohu's aforementioned positioning in the I&T industries.

Alignment with HK2030+: Strategic location along the Northern Economic Belt & Eastern Knowledge and Technology Corridor

7.3.16. This cluster is located at the intersection of the Northern Economic Belt and Eastern Knowledge and Technology Corridor (Figure 7.9). With reference to HK2030+, Northern Economic Belt aims to cater emerging industries and create new employment centers in NTN. This was explained by **Interviewee E**, who identified Northern Economic Belt as a strategic location for accommodating new, high-quality jobs, and can grow to become one of the main I&T industry employment sources. Locating jobs close to homes can reduce the commuting time and spatial mismatch in HK.

7.3.17. The transformation of this cluster into I&T clusters aligns with the vision stated in HK2030+, and optimizes the underutilized land in NTN. The Eastern Knowledge and

Technology Corridor is to concentrate universities and I&T nodes in order to agglomerate the I&T talent pool. LMC is proposed to have a new tertiary education institution, which can provide more high-skilled jobs in research and training of talents to further strengthen the Eastern Knowledge and Technology Corridor. The new university also has the development potential of specializing in the new fields of the I&T sector, such as Smart City and AI. The existing universities are currently putting greater emphasis on FinTech and BioTech, and the new university in LMCL can specialize in these other industries to diversify I&T development.



Figure 7.9 Location of the Cluster in relation to the proposed conceptual development axes in HK2030+
Source: Study Team

Optimization of brownfield land

7.3.18. KTN and ST are two of the largest clusters of brownfields in HK. Therefore, optimization of these sites is possible to release land for the I&T industry. As shown in Table 7.5, all the sub-clusters conduct brownfield-related with small houses, and have the potential to be further intensified.

Table 7.5 Existing land use in LMC/KTN/ST Cluster

ST	KTN	LMC
Small houses and brownfields (majority)	Brownfields	Small houses, car parking, brownfields

Source: Observation from Google map

7.3.19. From Singapore's case study, intensifying brownfield operation into Multi-Storey Buildings (MSBs) is a possible solution to optimize the use of land for brownfield operations and to release land for the I&T sector. There is an opportunity of locating logistics, manufacturing operation close to future I&T clusters as they can serve as a platform to test out and give inspiration to I&T innovations, such as AI. The close

proximity to research centers can strengthen the quality of research as well. From the brownfield operators' perspectives, their operations can be upgraded with a smarter production and services line with advanced technology, for instance AI can help performing repetitive logistic operations within MSBs.

- 7.3.20. The large brownfield areas that ST and KTN can provide vast amount of space to accommodate the needs of the I&T sector, as shown in Table 7.6. This can provide large amount of space to enable the companies, universities and government institutions to be set up in the area for the triple helix effect.

Table 7.6 Information on brownfields in the LMC/KTN/ST Cluster

Potential Growth Area	Total developable area	Area of brownfield sites	Major operation
ST	Data unavailable	65 ha	Logistics
KTN	320 ha	50 ha	Warehouse, waste recycling, construction

Source: Task Force on Land Supply, 2017; Development Bureau, 2019

Ideal Site Conditions for the I&T Sector

- 7.3.21. LMCL is intended to be an upcoming tertiary education campus. The area is characterized with its rural character, that can possibly bring a pleasant environment for I&T researchers that few sites in Hong Kong can provide. The site is also supported with the updated OZP. Aligning with KTN OZP, "Residential Institutions" is a permitted use to be located in KTN to serve as the quarters for I&T talents in this cluster. The agglomeration of talent quarters, research institutions and industrial space can enable a mixed community to be developed within the cluster.

Linkages of Relevant Facilities: Formation of the Triple Helix Model

- 7.3.22. Having the concept to emphasize LMC's role as the university anchor, the adoption of the triple helix model with spaces for I&T sector are concentrated in IE and MSBs in ST, and tech park in KTN. This cluster has the identity as a comprehensive package for talents, providing job opportunities after graduation from research institution from LMCL. Innovation, commercialization and services would be provided in this cluster. This development model adopts the example of Silicon Valley, where an integrated development model is adopted, and contributes to the enormous success of I&T hub within the region. Further details can be referred to Chapter 3.3.
- 7.3.23. Utilizing the strength in structured education system and free flow of information in HK, I&T education institution in LMCL will be a major provider of I&T talents for the NTN in the future. The location of LMCL aims to attract cross-boundary students and talents to study and work in HK, which also fosters the regional collaboration between HK and SZ.
- 7.3.24. The park in LMCL is the major part of the is one of the important cooperation platforms between SZ and HK's governments. Streamlined cross-border procedures and services to specialized workers are currently under study, and are explored with the utilization of advanced technology, such as the big data and face recognition.

Furthermore, cross-border capital flow will also be strengthened (Development and Reform Commission of SZ Municipality, 2018).

PC/TKL/HYW Cluster

7.3.25. Vision for this cluster: To diversify and strengthen the I&T industries in Hong Kong to **BioTech and AI** by providing sufficient space for these identified sectors and **synergizing with the software and BioTech base in Eastern SZ.**

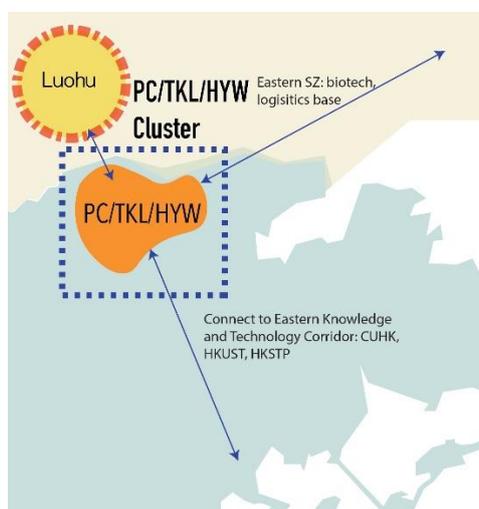


Figure 7.10 PC/TKL/HYW Cluster Spatial Interactions Within Cluster & Luohu
Source: Study Team

7.3.26. As shown in Figure 7.10, the PC/TKL/HYW Cluster includes the sub-clusters of PC, TKL, and HYW. The cluster contains one of the largest stocks of brownfields as mentioned in Chapter 5.5 with great development potentials for R&D and MSBs in PC/TKL, in order to optimize land for brownfield operations (Table 7.7). With close proximity to the BioTech base in Eastern SZ as mentioned in Chapter 4, the Cluster intends to specialize in BioTech and AI (Table 7.7). With the vast amount of land space available in HYW, in close proximity to Eastern SZ and becoming one of the newest BCP, HYW can be allocated for IEs and Science Park (Table 7.7). This cluster is an example of regional collaboration with Eastern SZ for the developing the BioTech industry. The cluster can be developed into HK’s BioTech hub.

Table 7.7 Functions of sub-clusters in the PC/TKL/HYW Cluster

Sub-Cluster	PC/TKL	HYW
Main uses	R&D; MSBs	IEs; Science Park
Major industries	Biotech (majority); AI	Advanced manufacturing; life science; software development; internet application
Role(s) in the production chain	Innovation; testing; services	Innovation; testing; services

Source: Study Team

Increasing accessibility to Central and Eastern SZ

7.3.27. This cluster has strong accessibility linkages with Luohu, Longgang and Yantian Districts (Figure 7.11) and is strongly connected with SZ via a network of motorways, in particular the new Eastern Cross-Boundary Highway. As identified in Chapter 4, the linkages to Eastern SZ is still developing, and the Liantang/HYW BCP is still in progress. The future connectivity is expected to enhance in the long-term. Meanwhile, the cluster has a high logistic capacity due to the proximity to Yantian Port and the LT/HYW BCP, which will directly be linked up with SZ's Eastern Cross-boundary Highway, Shawan Road Highway, and Weizhou-SZ Coastal Highway. The cluster can also benefit from high agglomeration advantages with Shenzhen's Eastern region in BioTech, a growing sector in Hong Kong's I&T industry. Opportunities should be explored to locate I&T activities that complement Luohu, Longgang and Yantian's aforementioned positioning in the I&T industries.

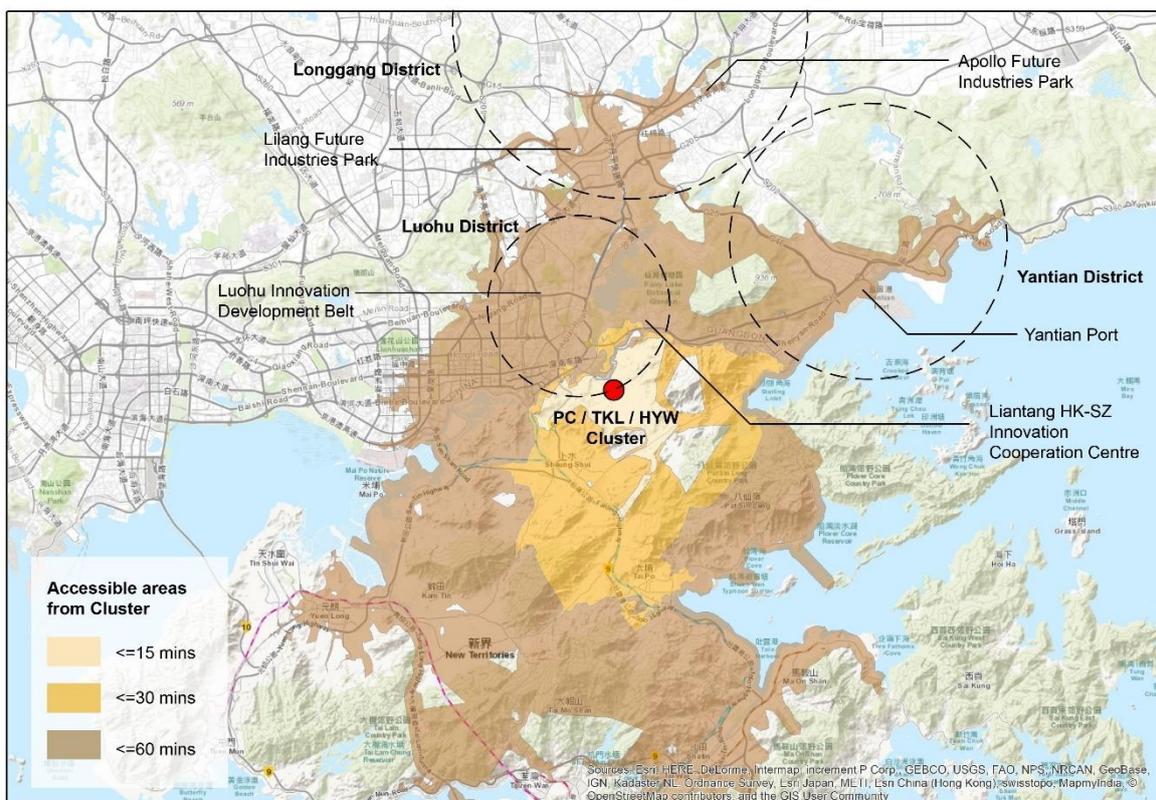


Figure 7.11 1-hour accessible areas in SZ from PC/TKL/HYW Cluster by motor vehicles
Source: Study Team

Alignment with HK2030+: Located along the Eastern Knowledge and Technology Corridor and Northern Economic Belt

7.3.28. The cluster is located at the Northern end of the Eastern Knowledge and Technology Corridor (Figure 7.12). It is grouped together as the NTN new towns with enormous employment and housing opportunities. It is planned for long-term development with major housing projects, as well as new IEs and science park spaces. This major provision of industry space for the I&T sector can act as innovation, service and testing grounds for universities along the Eastern Knowledge and Technology Corridor and LMCL, as well as acting as the main employment source along the Northern Economic Belt.

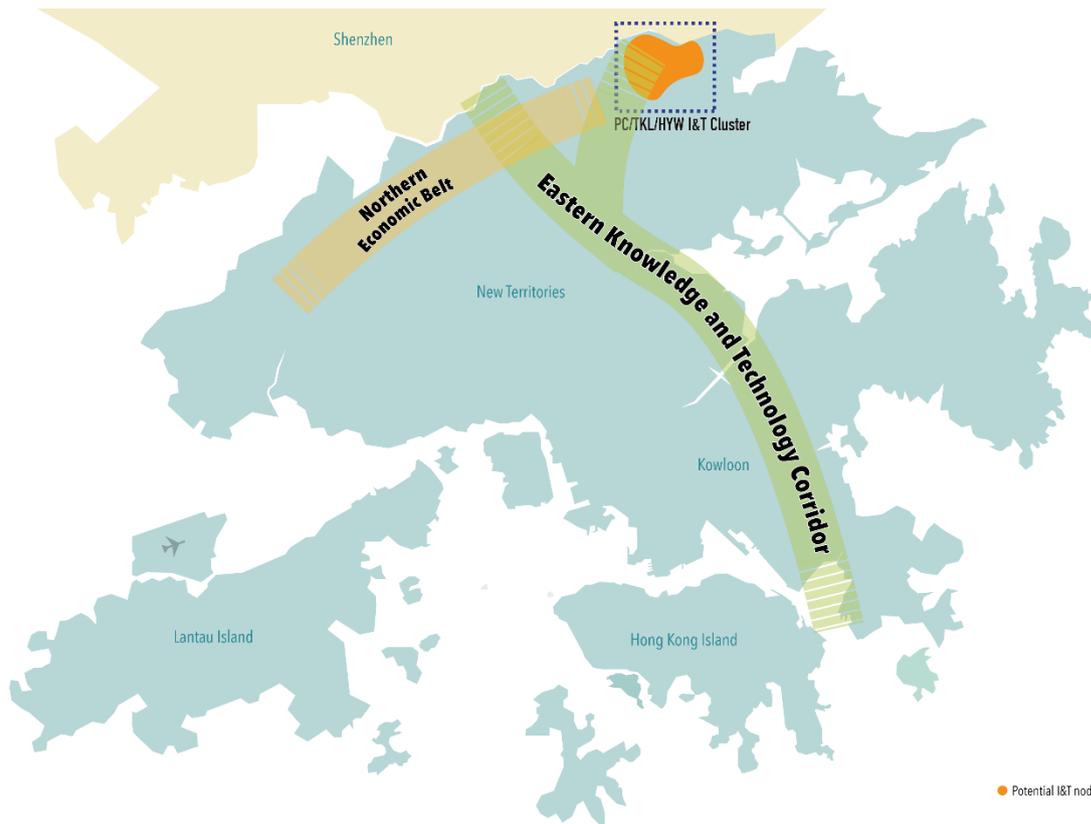


Figure 7.12 Location of cluster at the intersection of the Northern Economic Belt and Eastern Knowledge and Technology Corridor
 Source: Study Team

Optimization of brownfield land

7.3.29. A majority of the land is used for storage and waste recycling in PC/TKL NDA. These current uses lower its density when compared to other NDAs, as shown in Table 7.8. For the future development, the development intensity of the NDAs has to be increased in addressing the housing shortfall. The government has the intention of intensifying this area by discussing about the increase of the plot ratio to 1.5 to 3 and the greening coverage to 20%, whereas the specific planning has not been announced yet (TPB, 2013).

Table 7.8 Land use for PC/TKL brownfield

Storage/ waste recycling	Container yard	Open car-park	Others (wasteland, unknown)	Subtotal
82.5 ha	3.0 ha	3.8 ha	30.9 ha	120.2 ha

Source: Brownfield Research Team of Liber Research Community, 2015

Ideal site conditions for the I&T sector

7.3.30. The cluster has the largest land area among all of the proposed clusters and can thereby it can accommodate a diverse range of I&T industries, especially BioTech, AI and software to synergize with Eastern SZ. The enormous space provided can accommodate the land-intensive I&T industries, such as advanced manufacturing.

Linkages to Universities & I&T Nodes

7.3.31. Being part of the Eastern Knowledge and Technology Corridor, it is in a strategic linkage to CUHK and HKUST, as well as existing I&T facilities in HK like Science Park. It is possible to develop adopting the triple helix model within the corridor level, and to utilize the research strengths of CUHK and HKUST.

WK/ELM Cluster

7.3.32. Vision for this cluster: To strengthen the development of **FinTech** by the Cluster's strategic location in **close proximity to CBDs** as **testing grounds** to take advantages of the **regional and global markets**.

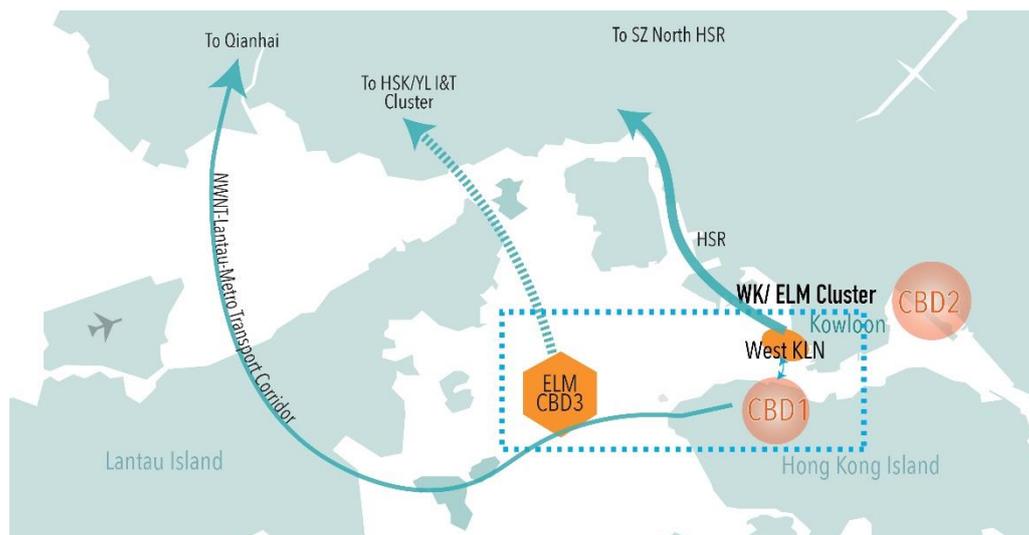


Figure 7.13 WK/ELM Cluster Spatial Interactions Within Cluster & HSR

Source: Study Team

7.3.33. As shown in Figure 7.13, the WK/ELM Cluster includes the sub-clusters of WK and ELM. WK is intended to be in close proximity to the underground space in TST, and the underground space is intended for commercialization purposes, which are currently lacking in the production chain of HK. ELM is intended to be the largest reclaimed site to be in close proximity to CBD1. Therefore, it acts as an extension of Grade A office space and FinTech testing from the CBD1 (Table 7.9). Therefore, WK/ELM can agglomerate with the FinTech development of the established CBD1, HKU, and Cyberport.

Table 7.9: Functions of sub-clusters in the WK/ELM Cluster

Sub-Cluster	WK	ELM
Main uses	R&D; commercialization and headquarter space; C&C industries	Grade A office space; FinTech testing
Major industries	FinTech	Diverse but specialism in FinTech
Role(s) in the production chain	Innovation; commercialization	Testing; commercialization; services

Source: Study Team

High Accessibility to HSR network with SZ

7.3.34. This cluster has strong railway accessibility with Futian, Longhua, Nanshan, Luohu and Longgang Districts (Figure 7.14). This extensive network is enabled by the cluster’s location next to the West Kowloon HSR Terminus. Hence, accessibility will be highest with Futian and Longhua Districts with the presence of HSR stations. The WK/ELM Cluster will enjoy great opportunity in providing headquarters function and front-office services in an HSR-enabled division of labor network with all the mentioned districts in SZ.

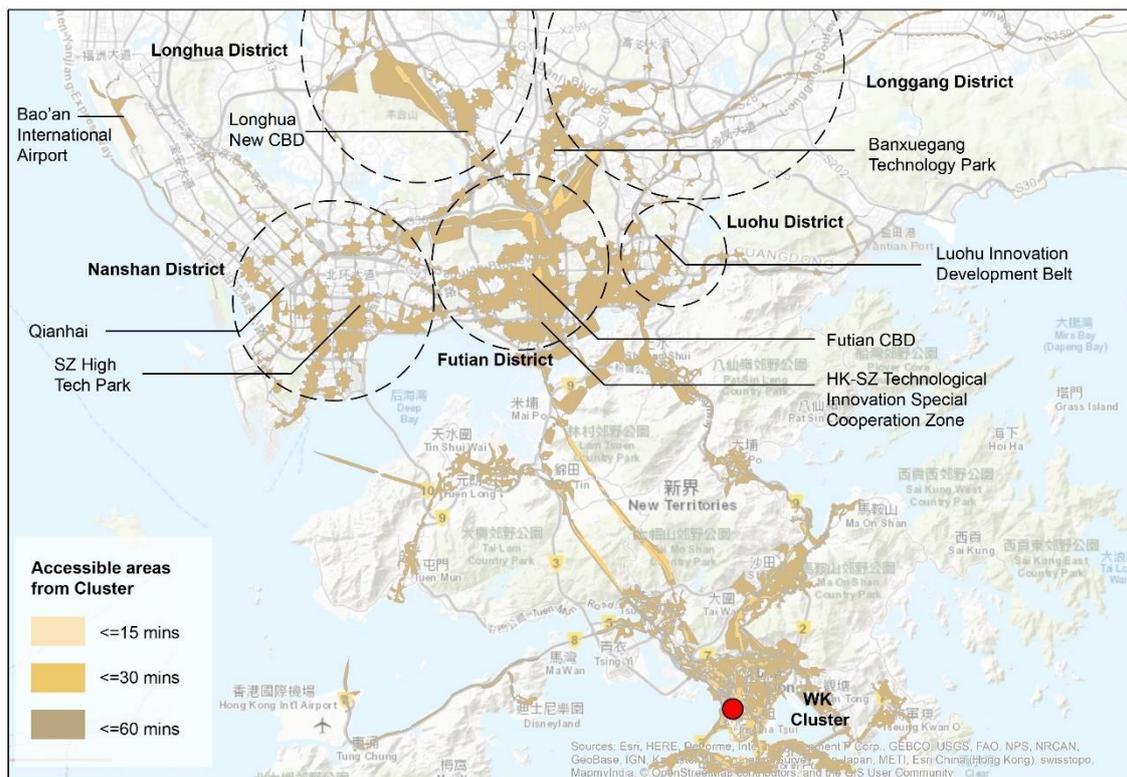


Figure 7.14 1-hour accessible areas in SZ from WK Cluster by railway transit and walking
 Source: Study Team

Note that accessibility analysis is unfeasible for the proposed I&T development in ELM as no concrete information on the size of the artificial and supporting transport links are available.

7.3.35. With the HSR Terminus, WK is a high land value site that can be used to foster collaboration with SZ and connect to other cities in GBA region. The site will be highly accessible at the HK and SZ context. Therefore, it is an ideal site for the commercialization of I&T products.

7.3.36. Due to the high accessibility between WK and the manufacturing base in northern SZ including Longhua and Longgang Districts via HSR, establishing WK as a high-tech I&T center can capture the economic value in this highly connected area. This will enhance free flow and exchange of talents between HK and SZ. From macro-perspective, the overall production chain in HK can be completed with the supplement of the advanced manufacturing industry in Longhua and Longgang Districts.

Alignment with HK2030+: One Metropolitan Business Core

- 7.3.37. This cluster is in close proximity to CBD1 (Figure 7.14), where the majority of HK's financial industries including banks, financial institutions like Hong Kong Monetary Authority (HKMA) are concentrated. Having the future I&T node near the urban center can help to commercialize and test I&T products locally, especially for the FinTech industry.

Optimization of underground space and reclaimed land

- 7.3.38. A network of underground space is proposed in the wider context of West Kowloon, connecting the Austin, Jordan, TST and East TST stations with underground spaces. Majority of the underground space is planned for commercial uses, and can support the commercialization of the I&T sector. The underground space is intended to be connected to the West Kowloon Cultural District (WKCD). In addition, the surrounding areas have dilapidated buildings and bus terminus with the possibility to be redeveloped (CEDD, 2019).
- 7.3.39. As for ELM, a total of 1,000 ha of reclaimed land is proposed for Kau Yi Chau. The artificial island is intended to provide vast amount of new space in close proximity to Central. An estimation of 200,000 high-value jobs is intended to be provided to HK. Some of the jobs cover the I&T sector, and can be a major strategic growth area and expansion for CBD1 (Legislative Council, 2018).

Ideal Central Location: Formation of the FinTech cluster with the Central CBD

- 7.3.40. I&T center in the core urban area is crucial to foster the commercialization of innovative products. The remote location of existing I&T hubs constrains the development of local I&T sector as they are detached from major business activities (**Interviewee B**). **Interviewee F** suggested that commercialization space is ideal for locating in close proximity to CBD to increase face-to-face conversations and level of collaboration.
- 7.3.41. The cluster is located in close proximity to the traditional Central CBD. The concentration of financial companies in Central has established the area to be one of the most renowned financial clusters in the world. Therefore, locating to close proximity can help strengthen the links with the financial industries and banks and the government institution for managing finance (HKMA). Apart from locating close to the industries that will directly become the testing ground of FinTech, the strategic location of being in the area of the HSR terminus can also increase the linkage between HK and SZ. As the financial industry and FinTech require an established cluster of financial industries for testing ground, a robust legal system, and a free market economy, the strategic location of this cluster can effectively satisfy the industry needs of the I&T sector.

Linkages to HKU, Cyberport and WKCD

- 7.3.42. Cyberport and HKU serve as important platforms for talent-and-innovator providers. Cyberport has high concentration of FinTech firms, whilst HKU excels in training talents in the financial industries. The linkages of HKU, Cyberport and CBD can foster first-hand information exchange, build network for FinTech industry, and keep in touch with latest FinTech products. This connection also forms the triple helix model for the FinTech industry.

7.3.43. WKCD is also a potential platform for testing out and showcasing smart living technology to public and tourists. As WKCD aims to become the cultural hub to nurture creative talents, there are opportunities for I&T and cultural talents to collaborate and innovate together and enjoy mutual benefits (WKCDA, 2019). Strong I&T will also help strengthen the positioning of HK as the popular tourist destination, which aligns with the objective of WKCD (ibid.).

7.4. Three Development Axes

7.4.1. Building on the three development axes proposed in HK2030+, three development axes are proposed and identified with different functions (Figure 7.15).

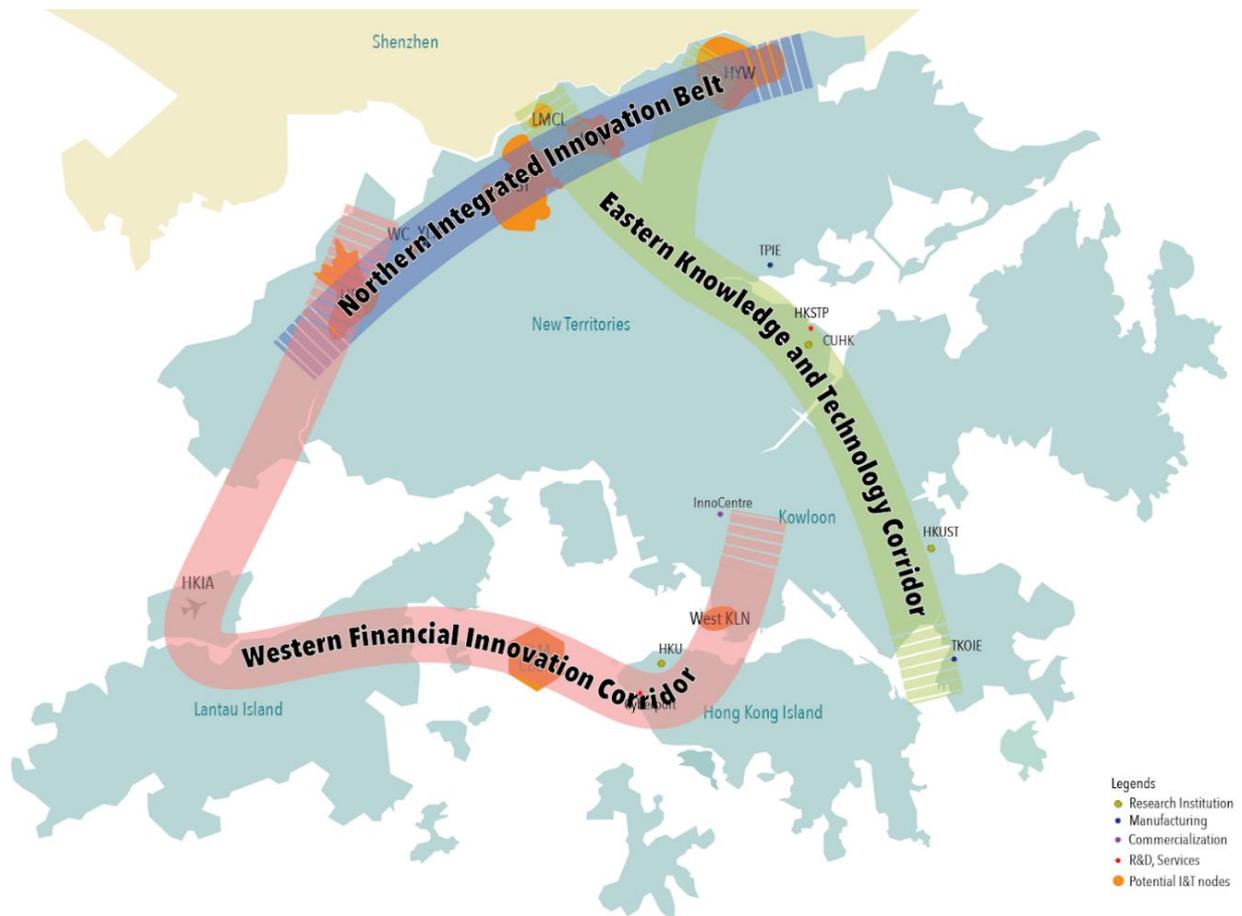


Figure 7.15 Three proposed development axes
Source: Study Team

7.4.2. The proposed development axes in HK can also synergise with the development axes in SZ. The integration of the development axes of HK and SZ can further promote the agglomeration in I&T development with increasing regional collaboration between HK and SZ. Figure 7.16 shows how the development axes are linked up with each other. The three proposed development axes are aligned with the development axes in SZ in order to foster the I&T agglomeration and regional collaboration between HK and SZ.

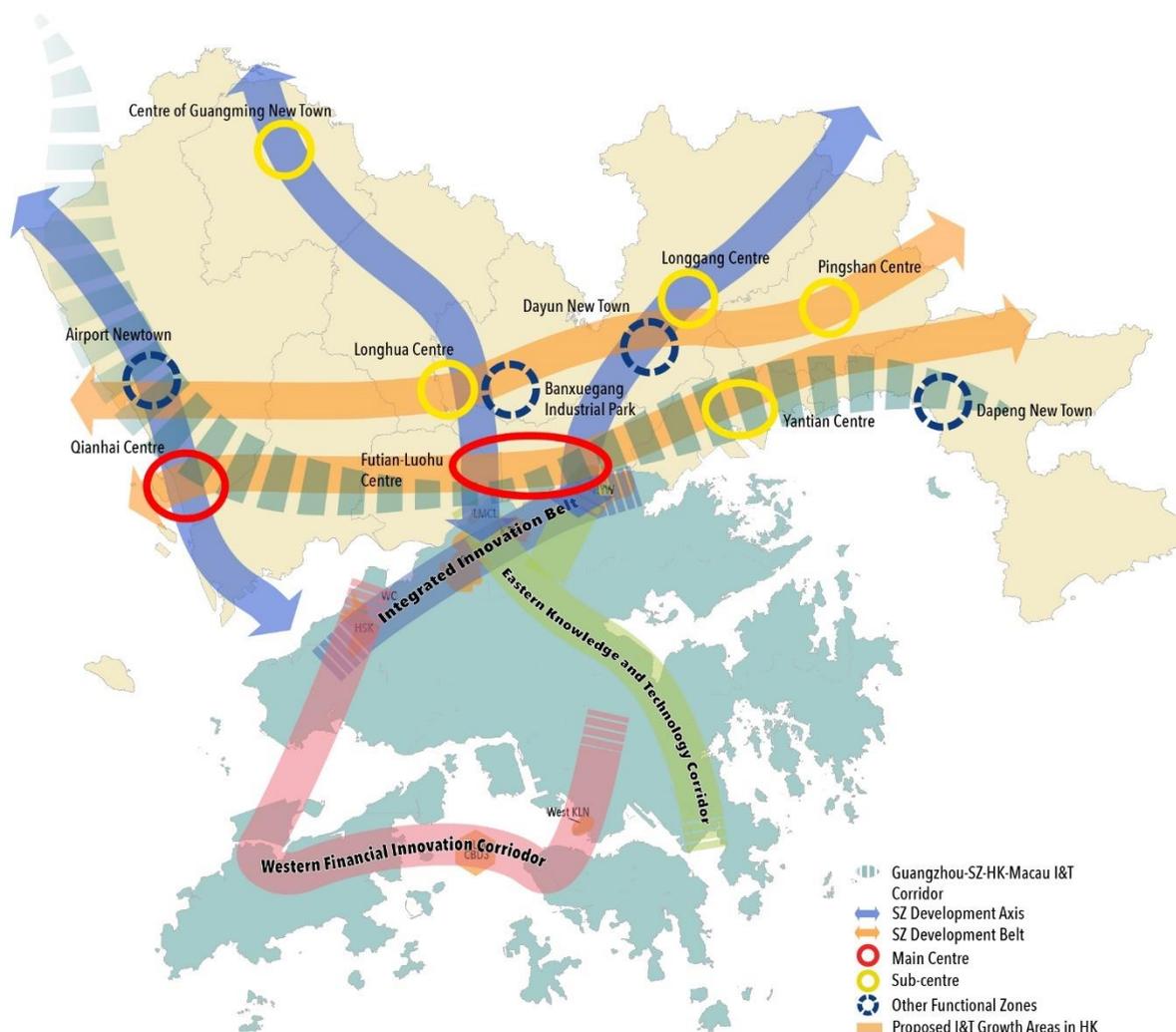


Figure 7.16 Relationship between proposed development axes and SZ development axes
Source: Study Team

Northern Integrated Innovation Belt

Vision

7.4.3. This belt is envisioned to form a complete I&T production chain and adopt triple helix modelling. It is comprised of an East-West corridor along NTN to capitalize on the identities of I&T in NTN with its the strategic location and close proximity to SZ. The I&T sector can become the major employment source in the belt (HSK, YL, ST, KTN, PC/TKL/HYW). The naming of this belt is based upon the vision of accommodating diverse I&T industries along the belt and to favor collaboration with SZ.

Align with HK2030+

7.4.4. This belt is in line with the planning vision of Northern Economic Belt in HK2030+, which aims to provide employment and housing opportunities in NTN. Introducing I&T sector to NTN will help to attract professional to work and live in NTN, and to transform NTN into a knowledge-based community. Its close proximity to SZ can foster cross-boundary collaboration and knowledge exchange. In addition, the existing underutilized space in NTN, in particular to brownfield operations, will be efficiently used as high value added economic activities.

7.4.5. In particular, HSK, locating at the intersection of two development axes, will be a strategic location for the I&T development and cross-boundary collaboration. With the close proximity to Qianhai, a strong I&T base in Western SZ, cross-boundary collaboration in the field of FinTech will be encouraged. The large amount of logistics operations in HSK provides the opportunities to innovate in I&T on modern logistics as well. With the assistance of strategic transport network, products will be shipped easily to global and regional markets.

Completion of the production chain

7.4.6. To maintain the competitive advantage of HK, a complete production chain of I&T products is necessary. With the distinct identities of clusters along this belt, a completed production chain will be formed to encourage the testing, production and commercialization to be done domestically, so as to strengthen HK’s position in I&T sector (Figure 7.17).

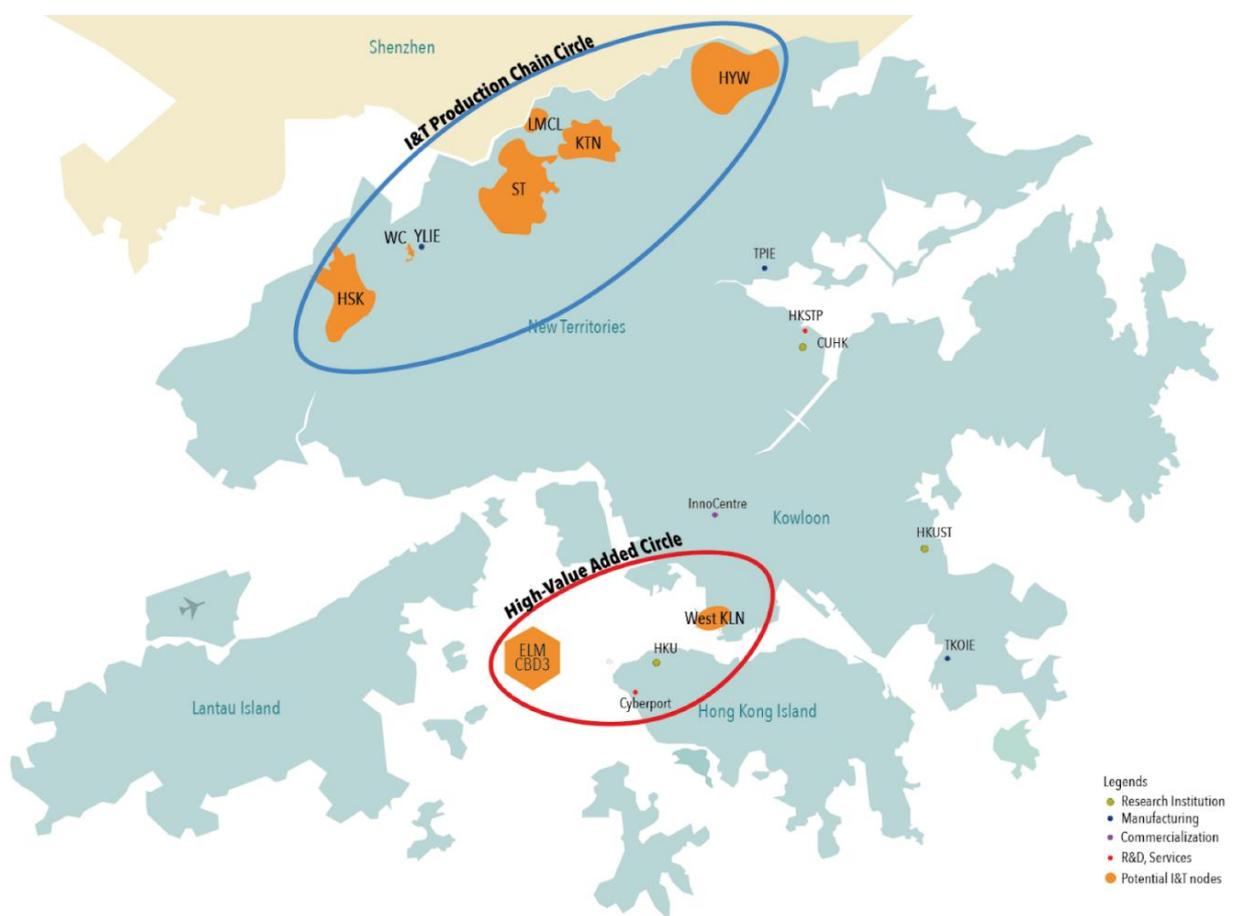


Figure 7.17 Relationship among clusters
Source: Study Team

7.4.7. As discussed above, LMC/KTN/ST Cluster will serve as the major provider of tertiary education students, and talents for nearby NTN I&T clusters for innovation works. This cluster is located along Northern Economic Belt and is further explained by **Interviewee E**, who identified the Northern Economic Belt as a strategic area for accommodating new and high-quality jobs and acting as one of the main I&T industry employment agglomerations. This freer flow of labor can benefit the growth of I&T sector in HSK/YL and PC/TKL I&T Clusters.

7.4.8. HSK/YL Cluster aims to provide opportunities for all five stages of the production chain, especially strengthening commercialization in HSK, and advanced manufacturing in YLIE. With the proximity of Qianhai, HSK has a high potential to develop as high tech I&T hub to create synergy effect on the collaboration of I&T sector with SZ. Qianhai can provide testing ground for robotics and electronics, such as driverless cars, to test out innovation products and undergo mass production in SZ (**Interviewee D**). In addition, as Qianhai is a financial center, the technology of FinTech can also be collaborated between the two cities (**Interviewee F**). As such, FinTech will be one of the focus I&T industries in HK. The proposed TM-CLKL by the government and Tuen Mun Western Bypass will connect HSK to HKIA and future ELM (Figure 7.18). This connection will favor the bridging of SZ I&T products to the international markets.

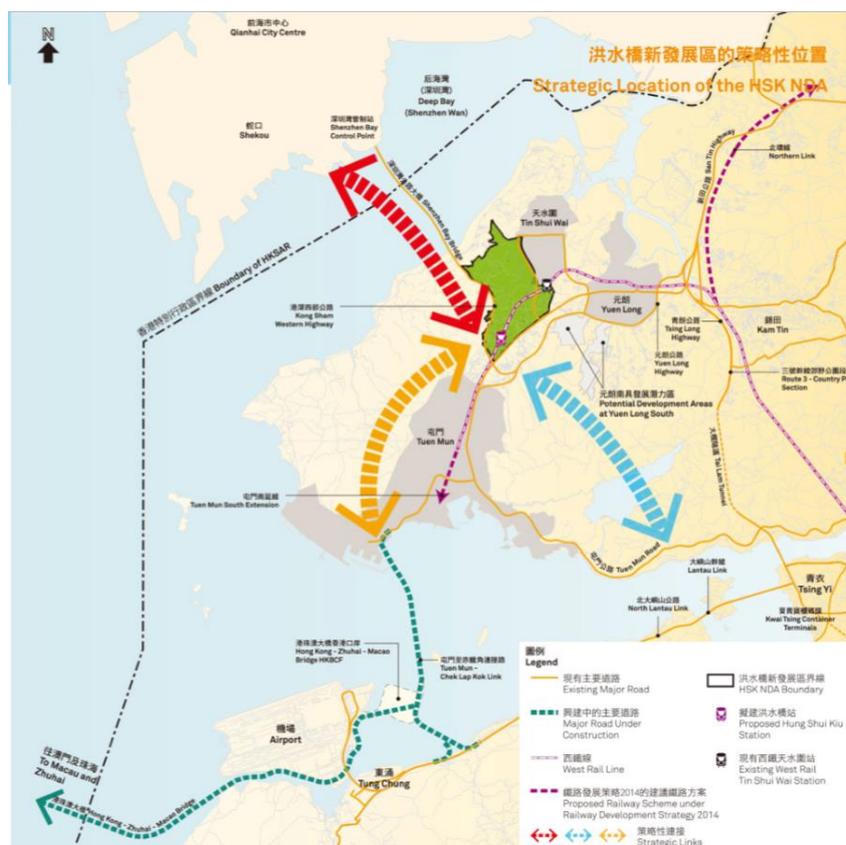


Figure 7.18 HSK’s strategic location to SZ and western part of Hong Kong
Source: Planning Department, 2015

7.4.9. PC/TKL/HYW Cluster, as mentioned earlier in the chapter, is suitable for building tech park and IE as it has a relatively low cost of production for the emerging I&T sector with its remote location in HK. Production of innovation products from the LMC/KTN/ST Cluster can be mass produced in PC/TKL/HYW Cluster. Moreover, this cluster will utilize upon the research strengths of the training of BioTech, medicine and health-related science talents from HK universities lying on Eastern Knowledge and Technology Corridor by providing land for R&D, with the aim of retaining talents. It helps synergize with the manufacturing base in Eastern SZ.

Interaction with SZ

- 7.4.10. The Northern Integrated Innovation Belt can capitalize on the I&T development in Central SZ with the close proximity and the availability of cross-boundary infrastructure. Futian-Luohu center functions as a traditional business and financial district with emerging I&T development like R&D, commercialization and services. Longgang and Longhua are the new districts with advanced manufacturing to complete the production chain of I&T sector.

Western Financial Innovation Corridor

Vision

- 7.4.11. The Western Financial Innovation is envisioned to strengthen the FinTech industry and to complement with the established financial system in HK. This can contribute in strengthening HK's position as international financial center in GBA initiative. Supported by strategic transportation infrastructure, such as HKIA and HZMB, this corridor is able to serve as international and regional gateway. This corridor has a coverage of the western and southern HK, including CBD1 and CBD2, HKU, Cyberport, ELM and HSK. It also spatially bridges the NTN, Lantau and SZ as a large I&T cluster through the proposed strategic transport network. FinTech is the focusing industry along this corridor due to the close proximity to existing and future CBDs, which serve as the testing and application ground for the maturity of FinTech. High value-added employment opportunities are provided in this corridor.

Align with HK2030+

- 7.4.12. This corridor is in line with the planning vision of Western Economic Corridor in HK2030+. The existing CBDs will be strengthened with the future FinTech development, which can maintain HK's international position as an international financial center. More professionals and talents will thus be attracted to work in HK. In addition, this corridor will create momentum for a knowledge-based economy along the corridor, which will help balance the economic structure and retain its competitive advantage in the financial industry.

Formulation of Clusters with Central CBDs

- 7.4.13. Moreover, the existing CBD1 will serve as the branding effect for overseas or mainland enterprises to establish their branches and to invest. Future FinTech services will be complementing the existing professional and financial services in CBD1. In long run, a world-class image in I&T sector will be established to attract more overseas investment, and help strengthen the overall economy in HK.
- 7.4.14. For WK/ELM cluster in the "One Metropolitan Area" stated in HK2030+, there is strong relationship with SZ and the proposed I&T clusters in NTN. This cluster focuses on high-value added products. With the proximity to CBD1 and 2, ELM and WK have high possibility for further expansion of office space in CBD1 and serve as the major innovation and commercialization space for FinTech. With the strategic transport network shown in Figure 7.19, both ELM and WK will have the direct link to Western (Qianhai) and Central (Longhua) SZ. There is a possibility for collaboration with HSK and Qianhai for cross-boundary FinTech activities and hence creates synergy effect.

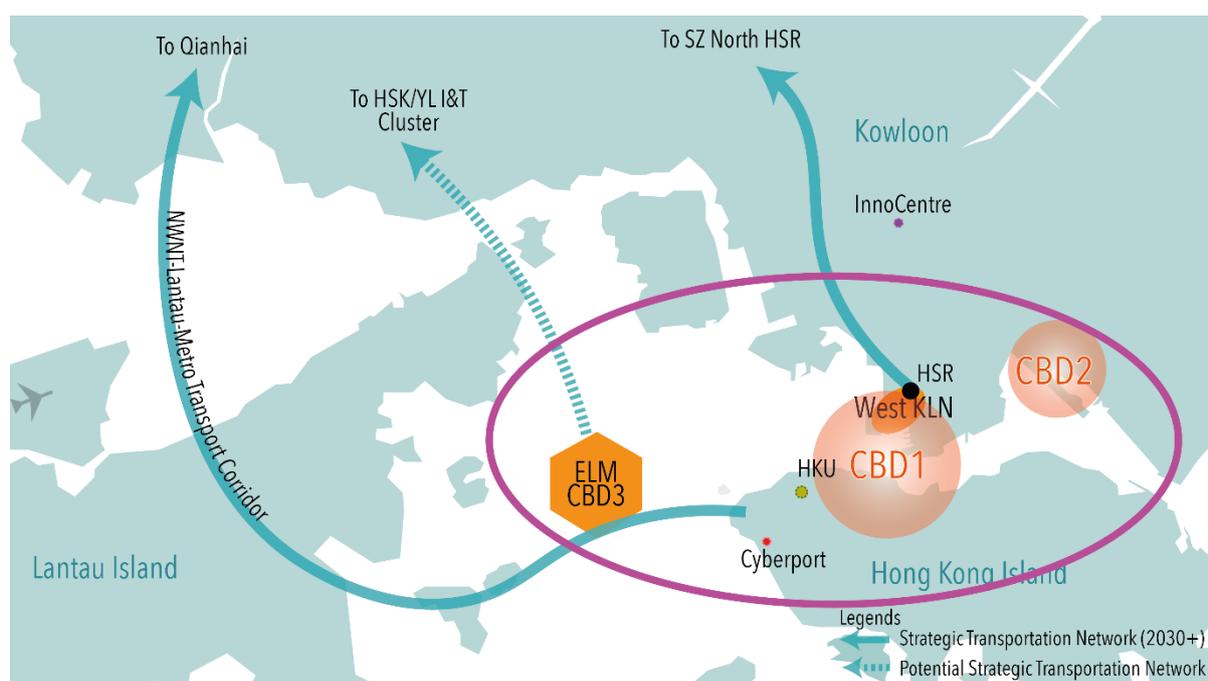


Figure 7.19 Relationship between West KLN/ELM cluster and other I&T clusters
Source: Study Team

Interaction with SZ

7.4.15. The Western Financial Innovation Corridor will have strong interaction with the Western Axis of SZ including Qianhai and Airport Newtown in order to strengthen its position as international financial center by developing FinTech and capitalizing the domestic and global markets. It can also facilitate the flow of domestic and international I&T talents with the transportation infrastructure like HZMB, HKIA and Bao'an Airport in the Western Financial Innovation Corridor and the western axis in SZ.

Eastern Knowledge and Technology Corridor

7.4.16. This Corridor was first proposed by HK2030+, and is strengthened with the further connections to the proposed LMC/KTN/ST Cluster and PC/TKL/HYW Cluster. The Corridor is envisioned to maximize the collaboration between existing and future universities, together with the future R&D centers and tech parks to promote and foster knowledge-intensive production.

Vision

7.4.17. The Corridor serves as the supporting industries for the growth of I&T sector by providing skilled labor to the I&T talent pool. Proposed tech park and IE development in PC/TKL/HYW Cluster is a part of the corridor as it also serves as the providers of skilled labor in BioTech.

Intensified Clusters of the Triple Helix Model

7.4.18. As the Eastern Knowledge and Technology Corridor passes through the existing universities of CUHK and HKUST, as well as the major I&T nodes of HKSTP, it has a potential synergy effect with the newly proposed science park in HYW and new university in LMCL for a regional triple helix effect.

Interaction with SZ

7.4.19. Meanwhile, the Eastern Knowledge and Technology Corridor is complementary to the development axes and belts in Central and Eastern SZ, while the emerging I&T industries like BioTech in the eastern part of SZ can strengthen and diversify the research fields of the I&T sector. Table 7.10 summarizes the overall comparison of the development axes proposed by the Study Team and HK2030+.

Table 7.10 Comparison of the development axes in HK2030+ & proposed spatial strategies

Development Axes (Proposed/Existing)	HK2030+	Proposed Spatial Strategies
Northern Integration Innovation Belt/ Northern Economic Belt	From HSK to HYW Vision: To provide high quality jobs in close proximity to new homes to reduce commuting time and increase in liveability. It is also located in close proximity to SZ as a strategic area for cross-boundary collaboration.	From HSK to HYW Vision: To develop I&T sector as major economic sector in NTN and to provide high value-added employment opportunity. The completion of production chain in I&T products is encouraged to strengthen I&T development capacity. A diverse range of I&T industries is encouraged for an integrated innovation ecosystem to diversify the I&T sector in HK.
Western Financial Innovation Corridor/ Western Economic Belt	From HSK to Northern Lantau Vision: To take advantage of the close contacts to international and regional markets and strategic transport infrastructure, as well as revitalizing HSK, Tuen Mun and Northern Lantau.	From HSK to WK Vision: To strengthen FinTech industry to complement with and supported by the well-established financial sector, as well as to maintain HK's position as an international financial center. To capitalize on the close proximity to HKIA and HSR by connecting to the global and regional markets.
Eastern Knowledge and Technology Corridor	From TKO to HYW Vision: To capitalize the development in the existing knowledge-based industries and higher educational institutions, as well as synergizing them with the new proposed university in LMCL and HYW BCP.	From TKO to HYW Vision: To further strengthen collaboration between universities and I&T sector. The corridor can also synergize with Eastern SZ with its strong BioTech base. It is a strategic corridor to diversify I&T sector by encouraging the triple helix model in existing and proposed universities and industries.

Source: Study Team

7.5. Conceptual Strategic Transport Network

7.5.1. With the proposed three development axes and four I&T clusters, it is important to increase their connectivity with existing and proposed I&T nodes at local and regional scale. Better connectivity can facilitate free flow of talents and goods, enhance the interactions between the I&T facilities and clusters and maximize the synergy effect of I&T development. Figure 7.20 shows the connection gaps between the I&T nodes and clusters. Further improvement in the strategic transport network will be required to implement for the proposed I&T development.

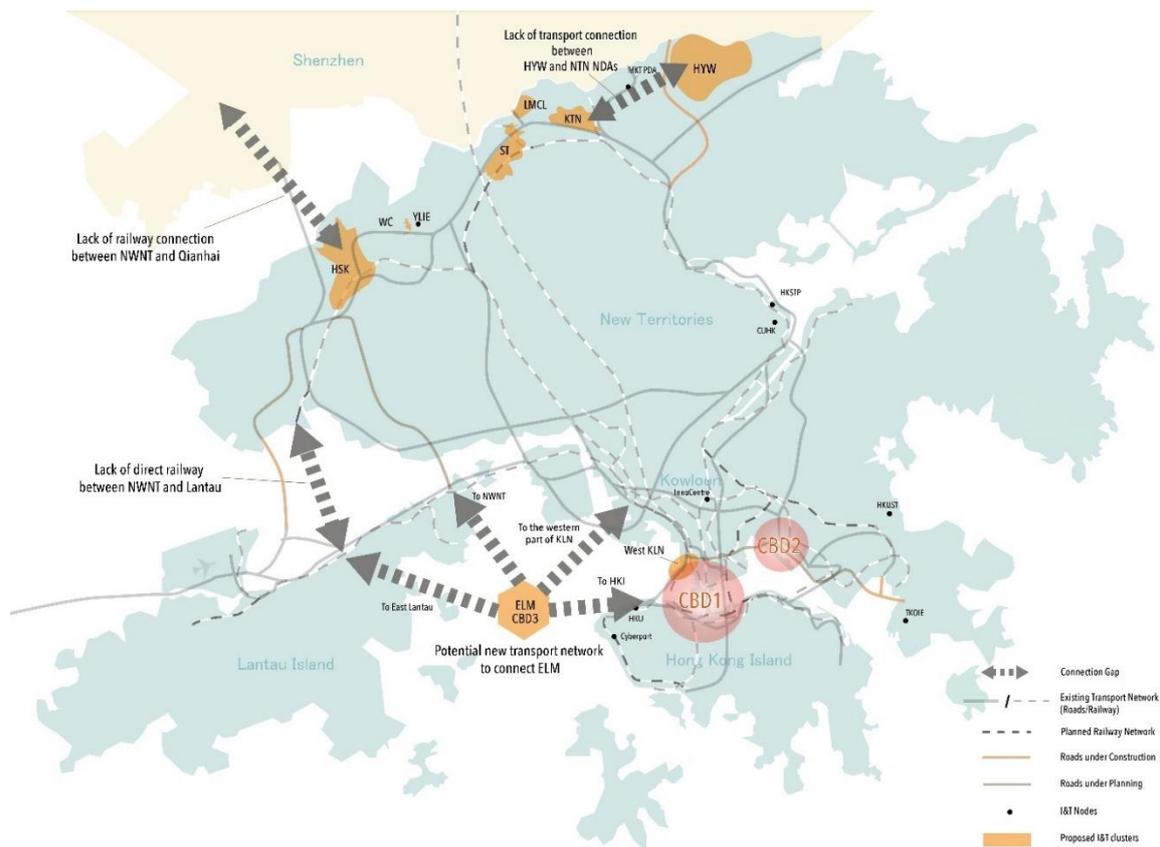


Figure 7.20 *Disconnection between the I&T Clusters*
Source: Study Team

7.5.2. First, as suggested in this chapter, ELM is one of the future I&T growth areas as the third CBD. It has the potential to become a transport hub with new network connecting to other CBDs and I&T nodes and clusters in the east and north. Besides the road project under construction (TM-CLKL), a railway connection between NWNT and Lantau is required to connect ELM with the I&T clusters in NWNT including HSK. In NTN, the railway (Northern Link) under planning and current major roads are not connected to the PC/TKL/HYW Cluster. The transport network in NTN should be extended to PC/TKL/HYW Cluster and HYW BCP to support future I&T development and link up the scattered I&T land use in NTN.

7.5.3. To achieve the proposed conceptual spatial framework, current connection gaps will need to be resolved and connectivity improved. Hence, a strategic transport network is proposed (Figure 7.21).

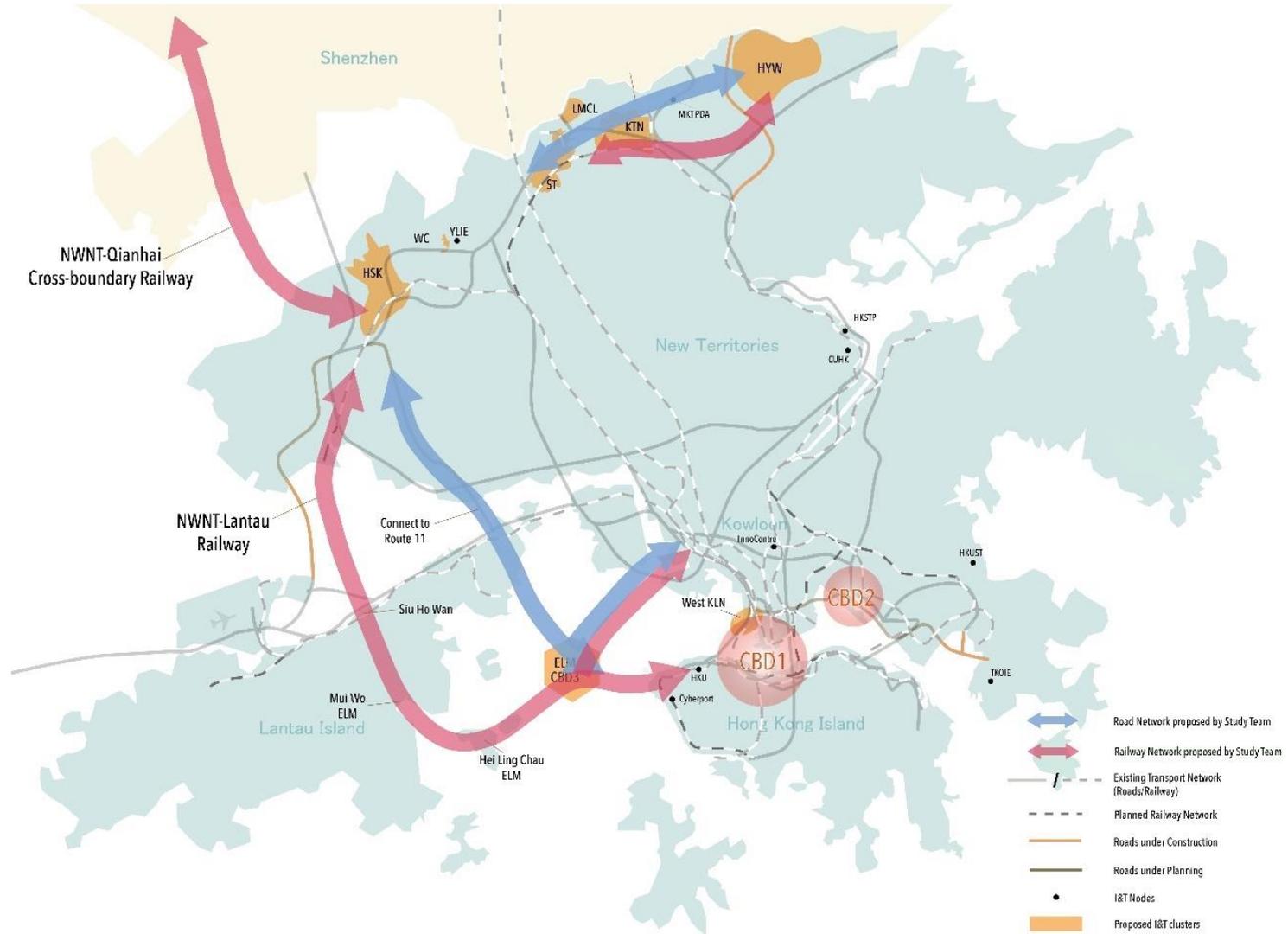


Figure 7.21 Conceptual Strategic Transport Network for I&T Development
Source: Study Team

WK/ELM Cluster with CBDs

- 7.5.4. As discussed in this Chapter, ELM CBD3 will provide office space and testing ground for FinTech, synergizing with other CBDs and I&T clusters like WK growth area and Cyberport. To enhance the connectivity between ELM and the urban core, a new highway and railway are proposed to connect ELM and the western part of Hong Kong Island. The proposed highway will connect ELM with Route 3, which currently links up Kennedy Town, CBD1, West KLN and CBD2. Meanwhile, the proposed railway is suggested to connect ELM to Kennedy Town in the Island Line. Taking advantage of future extension of the South Island Line (West) to Cyberport, it will be more convenient for talents to travel between I&T nodes and other CBDs in the urban core.

WK/ELM Cluster with KLN and NT

- 7.5.5. Besides the linkages to Hong Kong Island, a new road and railway from ELM to the northwestern part of Kowloon is proposed for better connectivity between ELM and I&T nodes in Kowloon and NT. The capacity of existing cross-harbor roads and railways are almost saturated, resulting in high level of traffic congestion in peak hours. The passenger rates of the two existing harbor crossing rail links, Tsuen Wan Line and Tseung Kwan O Line reached, if not exceeded their maximum capacity (102% and 97%) in peak hours (Legislative Council, 2016). For road transport, the Hung Hom Cross-Harbor Tunnel and Eastern Harbor Crossing exceeded their capacity by 77 and 38 per cent respectively in peak hours (Legislative Council, 2018c).
- 7.5.6. The proposed road will connect ELM with Stonecutters' Bridge, linking up with Route 8 to I&T nodes like CUHK and Science Park in the Eastern Knowledge and Technology Corridor and with Route 3 in NWNT. The proposed rail link will start from ELM to Mei Foo Station, the interchange of West Rail Line and Tsuen Wan Line, facilitating people to travel to I&T nodes in New Territories and Kowloon.

WK/ELM Cluster with the Western Financial Innovation Corridor

- 7.5.7. Besides, a road and railway network connecting ELM with the west and NWNT is also proposed to provide linkages for the Western Financial Innovation Corridor. Concerning the road network, the Route 11, currently under planning, will link up YL and Northern Lantau. Thus, it is suggested that the new road can be extended to provide linkage between ELM and Northern Lantau to promote the connectivity of road network in the Western Corridor. Apart from TM-CLKL, an additional railway is proposed to connect Lantau with the New Territories. For the proposed railway, Siu Ho Wan, which is an area with large residential projects planned (HK Government, 2018), is proposed to serve as an interchange station with Tung Chung Line so that future residents may enjoy more convenient travelling between the I&T clusters in ELM and the western part of Hong Kong.

HSK/YL Cluster & SZ Bay and Qianhai

- 7.5.8. HSK/YL Cluster in NWNT will have synergy effect with Qianhai and Shenzhen Bay in terms of collaboration in the I&T sector. It is important to develop more mature transport network between NWNT and Qianhai to stimulate the flow of people and goods. Besides the existing cross-boundary highway through SZ Bay Bridge, a cross-boundary railway connection should also be considered to strengthen the linkage between the two areas for the increasing cross-boundary traffic demand

associated with the growth of HSK/YL Cluster. The new cross-boundary linkage would also foster regional cooperation in the I&T sector.

PC/TKL/HYW Cluster with other clusters

- 7.5.9. Concerning the proposed Northern Integrated Innovation Belt, PC/TKL/HYW Cluster will combine with other I&T Clusters in the belt including LMC/ST/KTN and HSK/YL Clusters to complete the production chain and enjoy agglomeration benefits. The under planning Northern Link is proposed to extend to LMCL and HYW BCP to enable a continuous railway connection between various I&T clusters in the New Territories. Besides, a new major road is proposed to extend Route 9 (New Territories Circular Road) to PC/TKL/HYW and MKT to meet the increasing road transport demand associated with future I&T development in NTN.

7.6. Aspatial Policy Recommendations

Better talent attraction policies

- 7.6.1. Talent attraction policies can help to resolve Hong Kong's current weakness of providing little incentives for attracting talents. In order to attract talents to work in the I&T sector of HK, talent attraction policy related to the arrangements of immigration and improvements in the funding structure for I&T resources and talents should be considered. The immigration policies of the incoming talents can be more facilitatory so as to encourage more talents to work in HK, such as extending the duration of stay, and higher flexibility for case-by-case scenarios. More categories of talents can be considered to encourage a diverse range of I&T talents. To smoothen the immigration of I&T talents in the diversified I&T industries that the Team proposes Hong Kong to diversify into, including FinTech, BioTech, smart city, AI, smart production and modern logistics, can address Hong Kong's weaknesses by diversifying the currently homogenous economy.
- 7.6.2. As for funding, the government is the major funding provider of the I&T sector. The operation of funding is that the government distributes funding to public agencies that manage the I&T estates, such as Hong Kong Science Park and Technology Park Corporation (HKSTPC) and Cyberport. An I&T specialist (**Interviewee C**) criticized that this funding structure is currently quite rigid and allocated in a large lump-sum. There is a lack of guidance on how the fund should be distributed, as well as lack of monitoring on how the fund is used. Therefore, the flexibility of funding can be increased by breaking the funds into smaller and finer increments.

Increase collaboration between university and industry

- 7.6.3. Triple helix model is an important concept to justify the choice of locating the majority of the I&T industries in NTN, as suggested in Chapter 3. For the triple helix model to work, there should be vast amount of space to be provided for universities and industries, and in close agglomeration for them to locate close to each other. The formation of this ecosystem can foster a beneficial I&T environment that resolves the threat of the insufficient talents working or living in NTN in the long run.
- 7.6.4. In order to increase the collaboration between universities and the industry, more shared platforms and researchers should be encouraged at the policy and funding

aspects. The relevant courses of training talents with the expertise in I&T development can consider collaborating with the industry by providing work placement opportunities. A special focus of collaboration with the new university in LMCL can act as anchor to enable this process of developing of the ecosystem.

Ensure the most effective governance for the new I&T clusters

- 7.6.5. One of the threats is the uncertainty in the management of the I&T sector, which may lower the confidence of universities and firms to choose to locate in NTN. Managing the I&T facilities requires specialized expertise, relevant experiences, and extensive networking. Therefore, the most suitable agencies should be selected to effectively manage the I&T facilities. These agencies should be knowledgeable in the I&T market and the industry need in Hong Kong. Some agencies to consider are HKSTP and Cyberport possibly, as they are experienced in managing large-scale I&T facilities currently. Also, the management of I&T facilities is dominated by the public sector, and the role of the private sector might as well be considered. It is possible that the public-private partnership can be effective as a new governance model for the I&T sector.
- 7.6.6. As for the threat of the low level of willingness for talents to move to NTN, this can be resolved by providing incentives for the universities, industries and governmental institutions to set up sub-campuses in NTN. These institutions and companies can provide vast amount of employment opportunities and foster an I&T ecosystem in the NTN. The government can provide incentives for the universities and industries to locate in NTN, such as subsidies and discounts in rents.

7.7. Summary of stakeholders' changing needs to I&T

- 7.7.1. The stakeholders that have major impacts in facilitating the I&T development proposed in this report are: the government, industry, and academia. Different stakeholders will be affected by the I&T development at various degrees, as well as having different influential power in the process.

The Government

- 7.7.2. The government has a strong initiator role in providing policy and funding support for supporting the growth of the I&T sector. The bureaus that are responsible for shaping the changes in the I&T development are ITB in terms of software; and development bureau in terms of land provision for I&T uses.
- 7.7.3. For ITB, it should be an initiator to kickstart the I&T development and diversify I&T sectors. ITB can also be the coordinator or supporter for fostering the collaboration between universities and industries to complete the triple helix model and to ensure the quality of talents who are trained locally. Therefore, ITB should provide continuous funding in supporting I&T development as this industry has a relatively high upfront cost but relatively long time for profit return. ITB should also consider participating in more cross-boundary projects in utilizing the regional comparative advantages of this sector within the SZ and GBA contexts.
- 7.7.4. As for Development Bureau and Transport and Housing Bureau, an increased consideration of allocating suitable sites for I&T development and the knowledge of

suitable sites for the I&T sector is to be mutually understood through increasing collaboration and communication between the government and the industries. Policies and subsidies that can contribute to smoothen brownfield development and encourage the development on the brownfield land.

I&T Industry

- 7.7.5. The increased provision of spaces in HK2030+ can help complete the production chain, and provide spaces for expansion for the I&T sector. The completion of the production chain enables the industry to capture and retain values of innovation within the boundary of Hong Kong. Spatially, the new I&T firms are likely to be concentrated in Northern Hong Kong. The I&T firms may have to increase in virtual platforms to collaborate with Cyberport and HKSTP. The size of the market is also further extended to the mainland and international markets, which business plans with cross-boundary features should be considered.
- 7.7.6. The spatial strategies of concentrating FinTech development within the CBDs can allow the financial institutions and banks to become the testing ground of FinTech products. The close proximity can increase the efficiency of face-to-face conversations and strengthen the area's dynamics in developing in a production chain for FinTech.
- 7.7.7. Suitable management agencies are also needed to manage the upcoming I&T facilities. The agencies should have abundant experience in the sector and deep understanding of the sectoral needs. Some examples include the HKSTPC and Cyberport. With more policies directed for I&T development, one possibility is to grant these two agencies the authority to manage other proposed I&T sites. They can consider to setup sub-campus in the Northern Hong Kong in order to cope with the I&T development there spatially in the future. Their established basis can act as anchor to attract industries to locate in the Northern part of HK.

Academia

- 7.7.8. The academia is another important stakeholder to consider as the sector can train and provide talents for the industries. With the emerging I&T development as mentioned in HK2030+, substantial investment should be allocated for course design, recruitment of teaching staff and purchase of resources. Some possible methods of strengthening collaboration between universities and industries can include shared research platforms and internships.
- 7.7.9. For researchers and research institutions, more talents can be trained and retained locally. A Hong Kong scale triple helix model can be strengthened for the universities to have stronger roles. More large-scale projects at the local, regional, and international levels are more likely as the I&T sector is increasingly capable.

Table 7.11 Summary of stakeholder impacts

Stakeholders	Summary of stakeholder impacts
Government	<p>Innovation and Technology Bureau</p> <ul style="list-style-type: none"> • Continuous investment in relevant policies • Foster sectoral and regional collaboration • Encourage the diversification of the I&T sector (smart city and AI) <p>Development Bureau & Transport and Housing Bureau</p> <ul style="list-style-type: none"> • Consider I&T sectoral needs in site allocations • Increase incentives of brownfield development and relocation to NTN
Industry	<p>Existing I&T Firms and Startups</p> <ul style="list-style-type: none"> • Benefit from the production chain • Possible relocation of facilities to NTN • Increased in business opportunities with market expansion and cross-boundary projects • More available sites to accommodate the needs and expansion of the sector
Academia	<ul style="list-style-type: none"> • Increase resource input in the I&T relevant programmes • Further collaboration with the I&T companies and facilities in terms of shared facilities, platforms and work opportunities • Enhanced accumulation and retention of local talents and innovations

Source: Study Team

7.8. Key Takeaways to Stakeholders

7.8.1. Based on the summary of stakeholder impacts, Table 7.12 showcases the key takeaways to stakeholders. These are some future studies that are required to ensure the spatial and aspatial strategies are fully efficiently implemented and its effectiveness in promoting the I&T development.

Table 7.12 Key takeaways to stakeholders

Stakeholders	Key Takeaways to Stakeholders
Government	<ul style="list-style-type: none"> • Possibility of collaborating with the private sector in facilitating I&T development • Feasibility study for further strategic transport network of I&T nodes • Relocate or settle the affected stakeholders in the existing plans when more land is allocated for the I&T sector
Industry	<ul style="list-style-type: none"> • Investigation of the possibility of virtual platforms • Select and evaluate management agencies to manage the I&T sites • Consideration of set up sub-campuses as anchors in NTN
Academia	<ul style="list-style-type: none"> • Increase in the different types of spaces and resources for I&T development • Investigate the actual practicality of the triple helix modelling and sub-campuses in NTN

Source: Study Team

Key Takeaways for the Government

- 7.8.2. Currently, the government has a strong initiator role in managing the I&T development in Hong Kong. In order to enable the most effective governance structure for facilitating the I&T sector, inviting a private initiative can be beneficial and release some development burdens on the government. These private initiatives can include international corporations and strength companies in SZ. The choice of site and the governance structure should be investigated through further studies. In addition, the government should conduct feasibility studies for the further strategic transport network of I&T nodes to examine if they are feasible in the long-term, as well as acquiring funding from the legislative council by phases.
- 7.8.3. Some plans are already being rezoned and do not have any land allocation for the I&T sector. This proposal may affect some stakeholders that are being planned for in the updated OZP, and the government has to settle and relocate the affected stakeholders. For example, the existing logistics industries are planned to be relocated to MSBs in the nearby areas. However, some industries may require relatively large and open-air spaces, and they may have to consider other locations, with Ping Che being one example. Also, some planned residential units may be affected in this proposal, and the affected residents can consider relocating to Fanling North with further development density. Detailed estimation of the extent of relocation and areas to relocate should be further examined in detail.

Key Takeaways for the Industry

- 7.8.4. As the existing I&T facilities, such as Cyberport and HKSTP, are located relatively remote from NTN, the industry may face some spatial constraints and difficulties in relocating in NTN. Therefore, the industry can investigate in the possibility of virtual platform to overcome the spatial constraints and to ease the collaboration between the proposed NTN I&T clusters with the existing facilities.
- 7.8.5. The proposed four clusters have to be managed by suitable agencies that have experience and strong knowledge in the I&T sector. In the previous section, there is a recommendation that certain level of the private initiatives can be encouraged in order to maximize the efficiency of governance of the I&T sector. The industry can have a stronger role in shaping the I&T development.
- 7.8.6. For existing I&T agencies, Cyberport and HKSTPC should consider setting up sub-campuses as anchors of attracting talents and I&T funds to NTN. The actual practicality and the choice of location among the clusters have to be further investigated.

Key Takeaways for the Academia

- 7.8.7. As for the academia, the development of the I&T industries emphasizes on attracting and retaining more talents trained and attracted to HK. In order to facilitate the growth of the diversified I&T sector, the academia should increase in the different types of spaces and resources for I&T development, for example, increased in virtual reality equipment for the development of AI.
- 7.8.8. Universities and research institutions should also perform a stronger role in training talents, as well as producing innovations and promoting R&D achievements. The most effective measures to collaborate between universities and industries should

be further detailed out and integrated in universities, such as the increase in shared platforms, facilities, researches and work opportunities. The possibility and actual feasibility of setting sub-campus in NTN should be further examined.

8. Action Plan

8.1. Key Evaluative Considerations on Implementation

- 8.1.1. This chapter outlines the phasing and timeline of implementation with reference to some evaluative considerations and prioritised actions. The following considerations are being considered with reference to Task Force on Land Supply (2018) when deciding the implementation preference and phasing: **(1) Construction cost; (2) Urgency of actions; (3) Availability of land; (4) Favorable government policy; (5) Stakeholder aspiration.**

8.2. Conceptual Phasing Programme

- 8.2.1. With the goal of supplementing HK2030+, a conceptual phasing programme concerning the spatial planning strategies and policies related to I&T sector is proposed in short term (2019-2022), medium term (2022-2030), and long term (2031-2040). Some procedural and general implementation processes are not detailedly shown in the conceptual phasing programme, it is assumed that carrying out development projects require the following analytical studies on engineering, environment, feasibility, and consultation of the general public.
- 8.2.2. The conceptual phasing programme is subject to uncertainty and potential delay due to incompleteness of infrastructure, long time for bargaining and establishing a collaborative ground. Changes towards the conceptual and descriptive spatial planning strategies and supporting policies can be made if required when there is major adjustment in the strategic positioning of the government. Table 8.1 presents the proposed conceptual spatial planning strategies and supporting policies of the Study.

Table 8.1 Conceptual Phasing Programme

Proposed Clusters and Development Axes	Short Term (2019-2022)	Medium Term (2022-2030)	Long Term (2031-2040)
HSK/YL Cluster	<ul style="list-style-type: none"> Upgrade and fully utilize YLIE 	<ul style="list-style-type: none"> Relocate affected brownfield operators to MSBs Build up the I&T development capacity (i.e. enterprise and technology park in HSK) Connect the cluster to HKIA with road network (i.e. Tuen Man Western Bypass and proposed TM-CLKL) Increase corporation with Nanshan District in developing FinTech 	<ul style="list-style-type: none"> Strengthen the linkage between I&T clusters in NWNT and Qianhai
LMC/KTN/ST Cluster	<ul style="list-style-type: none"> Continue the construction in LMCL 	<ul style="list-style-type: none"> Develop educational institution in LMCL 	<ul style="list-style-type: none"> Build up the I&T development capacity (i.e. enterprise and technology park in KTN)
PC/TKL/HYW Cluster	<ul style="list-style-type: none"> Build efficient cross-boundary infrastructure 	<ul style="list-style-type: none"> Develop research institutions with existing universities 	<ul style="list-style-type: none"> Strengthen road network within the cluster
WK/ELM Cluster	<ul style="list-style-type: none"> Reprovide non-emergency purpose utilities outside the cluster 	<ul style="list-style-type: none"> Provide space and opportunities to develop and test FinTech Create platform for interaction between FinTech start-ups and clients Commencement of reclamation work in ELM 	<ul style="list-style-type: none"> Collaborate and complement with the FinTech market in Qianhai and other parts of SZ New highway and railway connecting to the western part of HKI New cross-harbor roads and railway to connect ELM with KLN and NT
Eastern Knowledge and Technology Corridor		<ul style="list-style-type: none"> Deepen the university-industries-government corporation of existing I&T facilities 	<ul style="list-style-type: none"> Strengthen the road network to LT/HYW BCP

<p>Northern Integrated Innovation Belt</p>	<ul style="list-style-type: none"> Resume brownfield land for I&T development as proposed by the government (HSK/YL and LMC/KTN/ST Clusters) 	<ul style="list-style-type: none"> Facilitate cross-boundary procedure Encourage the development of multiple I&T industries (i.e. BioTech, AI, Smart City etc.) 	<ul style="list-style-type: none"> Extend the railway (Northern Link) to LMCL and HYW BCP Extend the motorway network (Route 9) to PC/TKL/HYW cluster, MKT
<p>Western Financial Innovation Corridor</p>		<ul style="list-style-type: none"> New motorway joining under planning Route 11 to connect Northern Lantau and NWNT Strengthen HK's leading positioning in FinTech 	<ul style="list-style-type: none"> Proposed railway connecting ELM with Lantau and I&T clusters in NWNT

Source: Study Team

9. Conclusion

9.1.1. The Study has taken into account of the important concepts that are relevant to the collaboration development in I&T sector in Hong Kong and Shenzhen; identified the best examples from different continents to showcase the important elements in developing a city-region, in particular, its I&T sector; analyzed the current strategic and spatial development in central, eastern and western Shenzhen in building the foundation for collaborative development with Hong Kong; examined the opportunities and challenges arisen from the current I&T initiatives in Hong Kong and the external environment to develop the vision and its planning principles of the Study. As demonstrated in Chapter 4 and 5, Hong Kong should seize the opportunity in collaboratively developing its I&T sector with Shenzhen so as to strengthen its position as an international gateway by developing a set of strategic spatial strategy and aspatial policy in which the competitive advantages and strategic location of Hong Kong is best utilized. The conceptual spatial planning strategies are as follows:

- **HSK/YL Cluster**
To provide space for diverse I&T industries in the form of MSBs to increase the optimization of brownfield land, as well as envisioning the cluster to have the most complete production chain.
- **ST/LMC/KTN Cluster**
To accommodate diverse I&T industries with a special focus on smart city and AI, characterized by the triple helix model with a new university intended to be built in LMCL.
- **PC/TKL/HYW Cluster**
To diversify and strengthen the I&T industries in Hong Kong to BioTech and AI by providing sufficient space for these identified sectors and synergizing with the software and BioTech base in Eastern SZ.
- **WK/ELM Cluster**
To strengthen the development of FinTech by the strategic location in close proximity to CBDs as testing grounds to take advantages of the regional and global markets.
- **Northern Integrated Innovation Belt**
To form a complete I&T production chain and adopt triple helix modelling.
- **Western Financial Innovation Corridor**
To strengthen FinTech and compliment with the established financial system in HK, as well as to strengthen HK's position as international financial center in GBA initiative.
- **Eastern Knowledge and Technology Corridor**
To maximize the collaboration between existing and future universities, with future R&D centers and tech parks to promote and enhance knowledge-intensive production.

- 9.1.2. Apart from the conceptual spatial strategies, aspatial policies targeting talent attraction, collaboration between university and industry, selection of suitable agencies in managing the tech parks are also proposed in supporting the implementation of the proposed spatial strategies. It is believed that through strategically utilize its competitive advantages and strategic location to further develop the I&T sector in Hong Kong in bringing long term sustainable economic benefits to the city. The Study provides recommended phasing of the spatial strategies so that the government could effectively implement the above recommendations in respect to public and private sector. Careful analysis on, for instance, environmental and social impacts, feasibility, financial viability, global mega trends is subject to further investigation.

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Strategic Planning for Collaborative & Sustainable Development of Hong Kong & Shenzhen

APPENDIX

Appendix 1

Staffing and Organization Chart

Mr. YIP Ho Yeung, Jackin

Project Manager, Managing Director of Planning

Mr. Yip has over three decades of experience in town planning and strategic planning. Before starting up the SKYLINE Studio, Mr Yip worked for the Planning Department for more than two decades, mainly involved with strategic planning and planning studies. He is a fellow of the Hong Kong Institute of Planners (FHKIP), Registered Professional Planner (RPP), Member of Royal Town Planning Institute (MRTPI), and Royal Institute of Chartered Surveyors (RICS). He will take charge of coordinating the study procedure and is responsible for making final decisions in this project.

Ms. CHIU Man Nga, Jasmine

Deputy Project Manager, Senior Town Planner

Ms. Chiu has experience in the town planning sector for over two decades. Her previous experience of working for various international planning consultancies have provided her with solid foundation and expertise in various planning study and planning policies. She is a fellow of the Hong Kong Institute of Planners (FHKIP), Registered Professional Planner (RPP), and Member of Royal Town Planning Institute (MRTPI). In this project, she is responsible for formulating, coordinating the study process, and analysis in spatial strategies.

Mr. HUANG Chi Ho, Leo

Deputy Project Manager, Senior Transport Consultant & GIS Analyst

Mr. Huang has fifteen years in transport planning, and is experienced in transport data analysis, major transport infrastructure development, and strategic transport master-planning. He is an expert in GIS data processing, spatial analysis and thematic map productions. He used his expertise in various cross-border transport planning analysis and local transport data analysis. He is a fellow of the Hong Kong Institute of Planners (FHKIP), Registered Professional Planner (RPP), and Member of Royal Town Planning Institute (MRTPI). In this project, he is responsible for formulating transport policies, spatial strategies, and prediction of cross-border trends.

Mr. TAM Ho Ming, Derek

Deputy Project Manager, Senior Regional Policy Consultant

As the deputy project manager for this project, Mr. Tam has been working as a senior regional policy consultant, specializing in cross-boundary projects analysis, for over a decade. He is a fellow in the HKU Scholar Hub, with a research interest in regional and urban development in China, and the power relations between Hong Kong and Mainland China. He has written extensively on the cross-boundary implications and regional dynamics of the GBA in various academic journals, and is on the editorial board of several journals. In this project, he is responsible for formulating and coordinating the local and national policies, and analysis in spatial strategies.

Ms. HE Yi Si, Vivian

Secretary, I&T, Smart City Consultant

Ms. He specializes in FinTech, and its usage in various international banks to improve the efficiency of their products. She also widely advocates Fintech in cross-border projects throughout Asia. She is the director of a large-scale organization that provides startup and entrepreneurship consultancy in the Hong Kong science park for over decade. She is also an active FinTech educator to provide FinTech and Smart City courses in various institutions,

such as the Hong Kong University of Science and Technology (HKUST), and the Hong Kong Institute of Bankers. She is also fellow of the Great Smart Cities Centre in HKUST. In this project, she is responsible to formulate recommendations regarding the development of the I&T, smart city movement, and start-up entrepreneurship.

Ms. CHEUNG Man Lei, Minnie

Secretary, Environment & Sustainable Development Consultant

Ms. Cheung is an expert in the environmental conservation. She worked in the MTR’s environmental team for a decade to analyze the environmental impacts of various projects, including the Lok Ma Chau Loop. She is also an active educator in terms of sustainable development as the part-time lecturer of environmental assessment and environmental conservation in the University of Hong Kong, Institute of Planners, and the Institute of Civil Engineers. She also participated in various think tanks to advocate sustainable development to different communities in Hong Kong. In this project, she is responsible for formulating and revising the environmental recommendations in the strategic planning framework.

Ms. HE Li Hua, Lianne

Treasury, Economic Policy Consultant

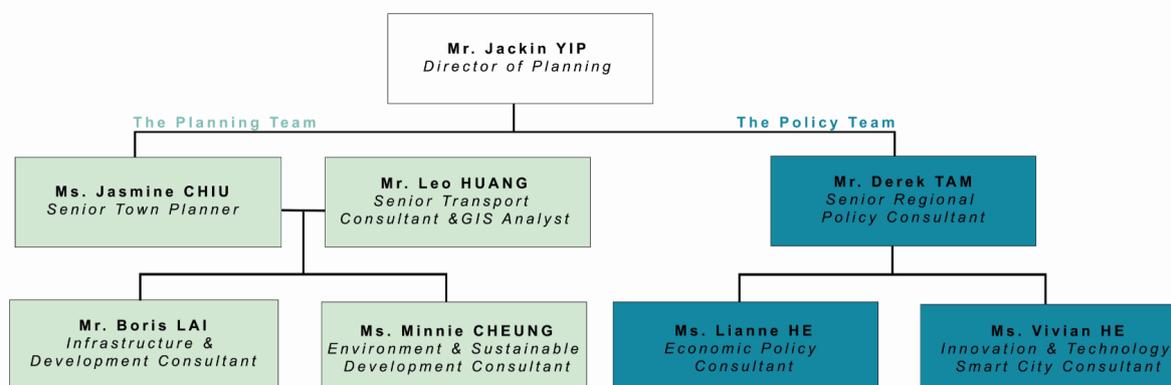
Ms. He has extensive research experiences in economic policies in academia, public and private sectors. She worked for various private consultancies to analyze the economic trends relevant for in-house projects, as well as the Office of the Government Economist as an Economist to analyze cross-boundary economic trends. She is a fellow in the HKU Scholar Hub, specializing in the economic policies in regional planning, with a special focus to the GBA and the PRD. In this project, she is responsible for formulating economic policies for the development of the Hong Kong in coping in the regional economies with SZ.

Mr. LAI JT, Boris

Treasury, Infrastructure and Development Consultant

Mr. Lai has expertise in infrastructure and development as a civil engineer for a decade. He worked for the Civil Engineering and Development Department for eight years, and worked extensively for the cross-border project of the Lok Ma Chau Loop, and the management of the Shenzhen River. His expertise includes the challenges of the cross-boundary infrastructure development, and the implications on the development on the Hong Kong side. He is a fellow member of the Hong Kong Institution of Engineers, and the Institution of Civil Engineers. He is responsible for formulating the recommendations for the strategic planning framework in terms of cross-boundary infrastructures and to mitigate possible negative implications.

Organization Chart



Appendix 2

AHP Questionnaire Template

Rate the relative importance of these pairs of criteria to each other in Hong Kong's strategic planning for collaboration with Shenzhen and growing the Innovation & Technology (I&T) Industry																		
What is the relative importance of these contribution factors to each other in terms of I&T sector growth?																		
<i>I&T Growth (9: Most important, other not important at all / 1: Equally important)</i>																		
Attracting Talents (e.g. reducing cost of living / operation)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Provision of Land / Floor Space
Attracting Talents (e.g. reducing cost of living / operation)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Accessibility of I&T Land-uses
Provision of Land / Floor Space	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Accessibility of I&T Land-uses
What is the relative importance of these potential benefits brought by HK-SZ Collaboration to HK?																		
<i>HK-SZ Collaboration (9: Most important, other not important at all / 1: Equally important)</i>																		
Job Opportunities	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Travel Convenience (e.g. Cross-boundary infrastructure / boundary checking software)
Job Opportunities	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Formation of I&T Supply Chain
Travel Convenience (e.g. Cross-boundary infrastructure / boundary checking software)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Formation of I&T Supply Chain
What is the relative importance of these criteria to achieving sustainability in HK?																		
<i>Sustainability (9: Most important, other not important at all / 1: Equally important)</i>																		
Enhancing Liveability	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Preserving natural / rural land / natural coast (e.g. minimizing development in agricultural / green belt areas)
Enhancing Liveability	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Combating Climate Change
Preserving natural / rural land / natural coast (e.g. minimizing development in agricultural / green belt areas)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Combating Climate Change

Note: The AHP Questionnaire is structured into three separate aspects, based upon the goal of this Study

The aspects are I&T Growth, HK-SZ Collaboration and Sustainability. A most important criteria will be chosen from these aspects via AHP Weight Calculation

Appendix 3

Summary of AHP Prioritisation Results

	Interviewee 1	Interviewee 2	Interviewee 3	Interviewee 4	Interviewee 5	Interviewee 6	Interviewee 7	Interviewee 8	Average	Std.dev
I&T Growth										
Attracting Talents	0.581	0.708	0.723	0.067	0.333	0.333	0.221	0.429	0.424	0.233
Provision of Land / Floor Space	0.260	0.209	0.174	0.444	0.333	0.333	0.052	0.143	0.243	0.118
Accessibility of I&T Land-uses	0.159	0.083	0.103	0.488	0.333	0.333	0.727	0.429	0.332	0.215
HK-SZ Collaboration										
Job Opportunities	0.334	0.282	0.525	0.198	0.299	0.729	0.727	0.574	0.459	0.203
Travel Convenience	0.143	0.597	0.142	0.322	0.542	0.218	0.221	0.286	0.309	0.173
Formation of I&T Supply Chain	0.523	0.120	0.334	0.479	0.159	0.053	0.052	0.140	0.232	0.184
Sustainability										
Enhancing Liveability	0.377	0.675	0.623	0.655	0.673	0.727	0.237	0.600	0.571	0.171
Preserving natural / rural land / natural coast	0.472	0.259	0.137	0.187	0.088	0.221	0.711	0.200	0.285	0.204
Combating Climate Change	0.151	0.065	0.239	0.158	0.238	0.052	0.052	0.200	0.144	0.077

Pair-wise comparison score of criteria. In other words, priority score of the criteria

Appendix 4

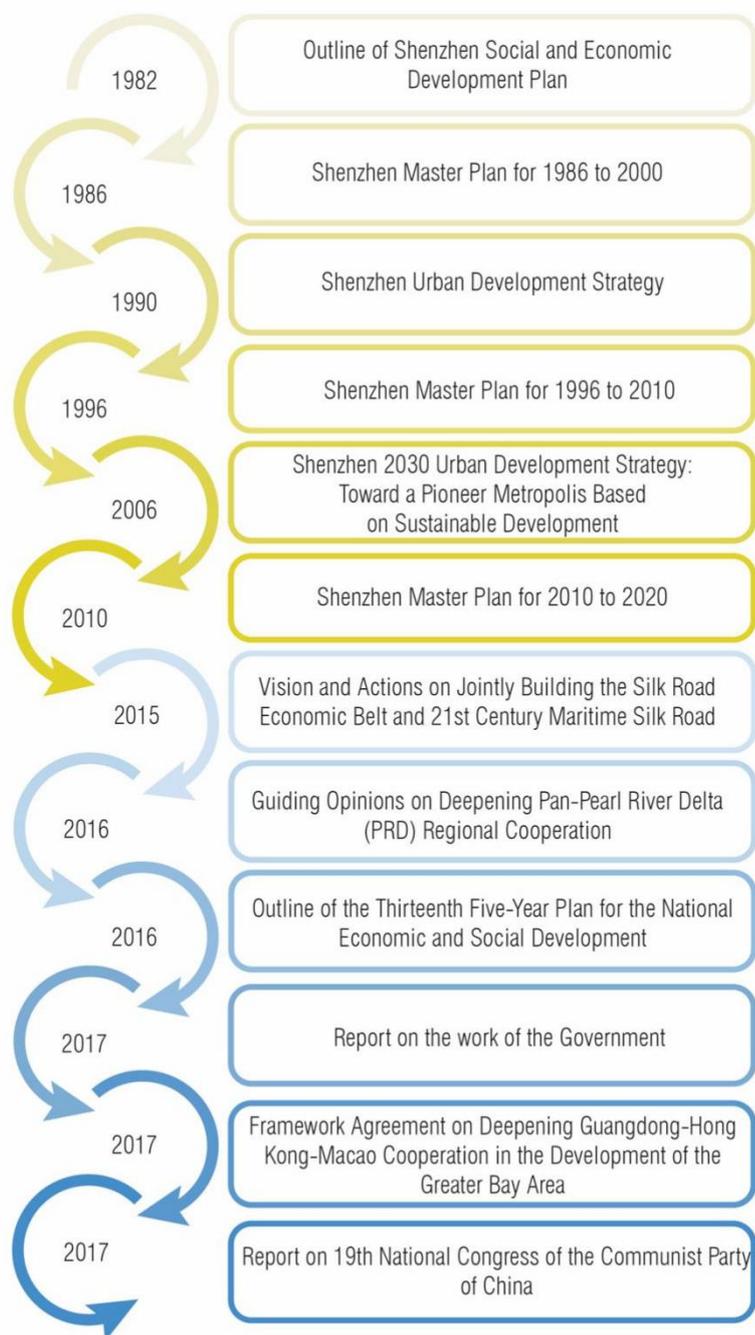
Information on Field Trip Locations for Task 2-2

The **Shenzhen Bay Eco-Technology Park** (“Eco-Tech Park”) is one of the important projects of strategic and emerging industries of the 12th Five-Year Plan of Shenzhen, beginning operation in 2014. The project is positioned as headquarters and R&D bases of public high-tech companies, platform of nurturing and developing strategic emerging industries and incubator of innovative SMEs. The park is an innovative mixed use master-planned project, incorporating 1,880,000 sqm² of offices, R&D facilities, commerce, residential units and lush open spaces in one development (Shenzhen Bay Technology Development Co. Ltd., 2017).

The **Qianhai Shenzhen-Hong Kong Youth Innovation And Entrepreneur Hub** (“E-Hub”) provides ideal geographical, spatial and institutional support for HK Start-ups operating in Shenzhen. It is situated in the Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone, providing a One-stop entrepreneurial support environment and comprehensive facilities, including intelligent security systems, centralised broadcast and telecommunications systems and internet coverage (Shenzhen Bay Technology Development Co. Ltd., 2017). It is an unprecedented example of a high concentration of HK residents in the I&T sector in SZ. If possible, we will also look into visiting the **Qianhai Institute for Innovative Research** for a more in-depth study.

Appendix 5

Timeline Showing the Evolution of SZ Strategic Plan and GBA Initiative



Appendix 6

List of interviewees

Scope	Interviewee	Identity
I&T	A	Representative from I&T sector (Science Park)
	B	Academia (Smart City)
Regional Planning Regional Planning	C	I&T Specialist (FinTech)
	D	Cross-boundary academia
	E	Academia (cross-boundary relations)
Strategic Planning Scope	F	Town Planner in the Planning Department
	G	Former Director of Planning at Planning Department

Appendix 6A

Gist of Interview

Interviewee A -- Representative from I&T sector (Science Park)

Date: 06/03/2019

Format: Face-to-face interview

1. Hong Kong lacks long term planning for the I&T sector
 - LMCL existed before 1997, but only raised the idea of developing into education/ I&T hub recently, without a clear justification why I&T hub should be located there
 - From interviewee's point of view, the sudden idea of LMCL development, collaborating I&T sector with mainland does not have concrete justification.
 - In the 80s, the service industry arose and manufacturing industry occupied less than 1% of HK economy, this led to high economic vulnerability. Therefore, HK needs high value-added manufacturing, which is I&T sector
2. In need for good transportation network for I&T sector
 - One major obstacle in developing science park is the poor transportation connection, the science park only contains bus service to Shatin or University station, which is not a whole day service
 - Low demand on public transport as there is no resident in the park
 - As there is no direct MTR station to HKSTP, even if HKSTP needs to expand transport network, it can only be limited to road-based shuttle service
3. Problematic zoning for the I&T sector
 - HKSTP is zoned as OU (Science Park), does not include "hostel" in neither C1 or C2, while only "hotel" is included in C2
 - Require supportive zoning system for the inclusion of dorms for talents
 - The reservation in land use zoning is due to the controversy of the Cyberport case, since then the public is skeptical towards science park related development
4. Mixed use should be promoted [used Singapore as the example]
 - The success of SG Enterprise park is because of the well-mixed use development, forming a community in the park, including multiculturalism, living, playing, education, achieving people basic needs
 - Currently, HKSTP has the largest issue of low vibrancy as "quarters" are not allowed to be built in the park
 - Suggestion: the ratio between office-residential institution can be adjusted, however, it must not be office-based only in order to attract people staying, and to create a vibrant community in the park
 - Education, C&C, I&T land uses should be combined
 - If tech park is located closer to university, the transaction cost will be lower to search for talents
 - If enough incentives, then the talents will be willing to move to the site

Appendix 6B

Gist of interview

Interviewee B -- Academia (Smart City)

Date: 18/03/2019

Format: Face-to-face interview

1. Regional transportation infrastructure
 - China devoted a lot on transportation financially to integrate Chinese cities
 - Transportation has its role to speed up physical integration
2. Development of SZ
 - SZ was importing goods and tried to imitate it and resell it in the past. However, there are 3 State-owned Enterprises (SOE) in SZ currently and improved its innovative capacity, e.g. Huawei has a lot of patent, investing more money on innovation than Apple. SZ has a more aggressive I&T development
 - Comparing with HK, HK is more conservative in terms its financial support to I&T. This is because there are many overseas company in HK and they have more considerations in shaping a healthy economic environment. However, HK has more international experience in risk and financial management, contributing to its own comparative advantage
 - SZ has a rise in housing prices recently along SZ North High speed rail station, as citizens can visit HK less than 50 mins including passing through BCP
3. Integration between HK-SZ
 - In terms of policy and transportation, HK-SZ are highly integrated, except the checkpoints act as constraints for cross-border facilities
 - In future, to have better cooperation, they should find their advantageous position, i.e. "Industrial complementarity"
 - Cities are driven by economic motives, and do not have the strong will to collaborate and integrate, competition is inevitable
 - This integration between HK and SZ is beneficial for both cities, if Hong Kong does not join this integration, the comparative advantage would be lost
4. Smart City
 - A major weakness of HK is that it has a high transportation cost
 - There is a lack of testing ground for I&T due to unsupportive policies and regulations. For example, HKUST has innovated driverless cars, whereas there is no place in HK to test out. They have to test it out in SZ

Appendix 6C

Gist of interview

Interviewee C -- I&T Specialist (FinTech)

Date: 11/03/2019

Format: Face-to-face interview

1. Potential collaboration between HK & SZ
 - SZ as the I&T leader, HK as the R&D leader with good integration potential, need for cross-boundary infrastructure
 - HK's comparative advantage as the common ground for the Western and Eastern cultures, HK can have the possibility to perform the role as the mediator to store the big data
 - Biotech is HK's strength in the I&T field, testing of medicine in HK
 - Qianhai
 - Past: apply the urban and social system which is similar in HK
 - Current: HK should learn from the successful case in Qianhai. LMCL becomes a place for HK-SZ cooperation
2. Lack of long-term planning for the I&T industry
 - Lack of long-term strategic planning to justify the locational choice and the fund allocation for Cyberport and Science park
 - I&T is managed by the Innovation & Technology Bureau, but it is the smallest bureau with the least amount of power granted, should be more ambitious for the start-ups to have trial and error
3. Recommendations for startups
 - He suggested that the start-ups should own the land, and the capital, following the successful model of the MTR to combine its service with real estate
 - Real estate as the source of finance for the startups
4. HK's role in the I&T development
 - The physical proximity between HK and SZ has brought great competitive advantages for both cities in the form of city-regions
 - HK should fulfil the gap of providing higher education, only SZ University on the SZ side, suggest having R&D in HK and production and testing ground in SZ
5. Need for integrating the cross-boundary statistic and big data
 - GBA cannot really help much on integration of statistics, eg. ticket buying on transport tickets, difficult for HK people to use e-payment in mainland
 - Suggesting HK develop electronic ID

Appendix 6D

Gist of Interviews

Interviewee D -- Cross-boundary academia

Date: 14/03/2019

Format: Face-to-face interview

1. The development of Longhua is important to central SZ development (also whole SZ)
 - Current developments focus on special economic zone, the land is limited—— Longhua acts as an alleviation of population and land (similar to the development intentions in Sha Tin——Driving the industry and commercial)
 - Metro Line 4: the busiest subway line, cross-regional travel
 - An example of SZ's clustering development, which benefits city's operation
 - SZ has multi-centres with multi-function
 - The I&T development in Longhua is based on existing industry
 - Competition is existing, with the overall development in SZ, each region will find its focus, the different industries come from competition
 - SZ government decides the development direction according to the market and also adopt government holding
2. Cross-boundary
 - Border crossing time is still a problem (difficult to improve because of legislation or rules)
 - Soft system (some intangible things ——humans, capital) is difficult because of the two systems
 - Technology development will bring new possibilities (like in SZ Bay and West Kowloon)
3. Industries related to cross-boundary
 - Human mobility is the most important. The most important cost in High-tech is talents
 - LMCL may provide an efficient way of border crossing
 - Superport: a preliminary consideration, LMCL, FT Free Trade Zone—— make use of its convenience; give priority to scientific research personnel
4. Education
 - Education is one main factor to innovation; GBA is hugely concerned about the knowledge economy; education is the foundation.
 - Education is an easy place for cooperation and communication (to be regarded as the public sector), easier to achieve consensus (the reason why LMCL will focus on education), since it is more about public interest instead of individual ones, there will be less controversy
 - HK: basic education, scientific, core basic research and development is still the main point to have cooperation with HK tertiary universities
5. The competition between SZ and HK
 - HK: financing platform, information (hardly to be replaced even by Tokyo, Singapore) need to focus on its strengths

- The cost, flexibility in HK may change in the future (HK's young people seem not to be so worried about the inequality through cooperation)
- Competition is existing, but will not affect too much (back to Point 1)
- PRD was born out of competition

Appendix 6E

Gist of Interview

Interviewee E -- Academia (cross-boundary relations)

Date: 20/03/2019

Format: Face-to-face interview

1. HK's comparative advantage in the regional context
 - HK has close contact with the global capital communities, with good reputation of regulations and protection of interests, resulting in the favoring of international companies in putting capital in HK before going into Mainland China
 - Skeptical about the GBA idea, believe that there will be more competition than cooperation
2. Loss of comparative advantage due to the economic over-specialism and little investment on R&D
 - Hong Kong moved from the manufacturing and producer services very smoothly, without much unemployment, which was extremely unusual
 - But Hong Kong does not really make significant progress recently like Kai Tak Development, West Kowloon
 - Lost the opportunity to diversify the economic options, specialism in the stock exchange and the real estate markets
 - Little attempt for R&D: Cyberport and Science Park only
3. Competition of Qianhai and Hong Kong
 - Less optimistic on the cooperation, but on the competition on the finance sector
 - Qianhai also aims to develop itself as the financial centre with ICAC in Qianhai, to have a similar identity of becoming a financial centre in HK, which can lead to competition
4. Need for aspatial considerations
 - Capital is frictionless, not spatial (spatial planning is no longer the main consideration)
 - The institutional framework for governing the regional planning matters
5. Comments of Central SZ
 - The effect of the Superport to be seen in the medium to the long term
 - Free Trade Zone is a relatively old concept like in late 1980s. It may be outdated when the space is not an essential element
 - Locating logistics uses in the Superport and the Futian Free Trade Zone can help to alleviate the land shortage in HK

Appendix 6F

Gist of interview

Interviewee F -- Town Planner in the Planning Department

Date: 08/03/2019

Format: Face-to-face interview

1. NDAs and LMCL

- LMCL and NDA are considered as one unit
- In general, the border of HK have overall ICT planning, for example there are logistics and some R&D site in HSK, while Liantang Heung Yuen Wai in HK2030+ is wholly residential and R&D facilities
- The advantage of border region is to have free flow of information and knowledge with talents from SZ
- Electric buses and hybrid buses to be run throughout the north KTN
- Admitted that it is quite difficult to attract talents from the city centre
- NDAs position themselves as self-sustained communities, residents from the city centres and international workers shall live in the dormitories in LMCL
- LMCL is expected to be quite quiet at night, encourage the residents to live in KTN

2. Different Roles of NDAs

- Role of LMCL is on higher education, for example, for university campuses
- Role of KTN is a business park, similar to Cyberport and science park, having business model inside the park for working
- Role of HSK is on logistic R&D. Due to results from 3rd stage public engagement, there are many existing logistic industry on brownfield, it is hard to look for another large piece of land and move them away. Therefore, the existing users want to stay and locate R&D in other districts. The main infrastructure supporting HSK business will be the future Guang Sum expressway

3. Functional Mismatch of HSK & Qianhai

- Nanshan and Qianhai positioned as the important I&T hub with Tencent Headquarters, the most direct link to HSK spatially
- With the previous history of brownfields and the logistics industries, the majority of HSK is for logistics-use, mismatch with the high-tech identity of Qianhai
- Minimal coordination between the Hong Kong and Shenzhen governments
- Guang Sum expressway is an aggressive concept, connecting airport to Nanshan, Bao' an airport. It is too expensive because of construction cost across the sea and Mai Po, with high ecological impact

4. Major differences of NDAs and the existing new towns

- More requirements for urban design, greeneries, and landscape framework
- Comprehensive network to connect from the station to workplace, considering all-weather conditions

APPENDIX 6G

Gist of Interview

Interviewee G -- Former Director of Planning at Planning Department

Date: 20/03/2019

Format: Face-to-face interview

1. Role of the Northern Economic Belt

- Greatest benefit is to create high quality jobs (economic development), the locations that provide high quality jobs are connected via the Northern Economic Belt
- Set aside land for jobs, can accommodate 400,000 jobs
- To fix the spatial mismatch of jobs and homes
- Livability is to lower the commuting between jobs and homes
- A lot of new homes will be created in the Northern Economic Belt, need economic magnet from Shenzhen and GBA
- Highly urbanized development belt with SZ, buffer for SZ and HK for environmental protection (protection of the wetland)

2. Regional role of HK

- Do not think HK only should only act as the connector, because it can be easily replaced
- HK has the value beyond being the connector, not ambitious enough
- HK should create its own capacity (innovations, businesses, capacity of generating wealth)
- To have good innovations in Cyberport and Science Park, not just connecting people together (“not adequate”)

3. Land requirements for I&T firms & housing

- IT firms would like to own their premises, should have low PR to only house a few numbers of companies within the building to protect the intellectual properties and confidential innovation
- The main cause of the problem: mechanism to provide residential unit to the talented population
- SZ attracts talents with money, housing, visa, cannot be easily duplicated in HK [InnoCell only can accommodate for single or couples], not solely about the physical proximity, how to allocate flats to the targeted talents (physical proximity is not the most important)
- The mechanism for differentiating talents matters, and is unique to the Mainland system, cannot have it in the free market system in Hong Kong

4. Government's keen role to push forward the I&T role and role of I&T sector

- All economic sectors need I&T sector to drive it forward, even the most traditional economic sector agriculture needs I&T (building construction, design for manufacturing)
- Gradually not a distinctive sector, but every sector has a strong I&T sector to drive each sector