



September 2014

# Railway Development Strategy 2014



運輸及房屋局  
Transport and  
Housing Bureau

# Contents

<b>1</b>	<b>INTRODUCTION</b>	<b>1</b>
	Background	2
	Policy on Railway Development	3
	Previous Railway Development Studies	5
<b>2</b>	<b>THE REVIEW AND UPDATE OF THE RAILWAY DEVELOPMENT STRATEGY 2000</b>	<b>7</b>
	Objectives of the Study	8
	Planning Context	9
	Direction for Updating the Railway Development Strategy	16
	Public Engagement	18
<b>3</b>	<b>THE STRATEGY – OUR FUTURE RAILWAY NETWORK</b>	<b>21</b>
<b>4</b>	<b>BENEFITS, IMPLEMENTATION AND COSTS</b>	<b>51</b>
	Benefits of the Expanded Railway Network	52
	Implementation	57
	Coordination with Other Public Transport Modes (“Public Transport Hierarchy”)	63
	Order of Costs	64
<b>5</b>	<b>ASSESSMENT OF OTHER RAILWAY PROPOSALS</b>	<b>65</b>





# Introduction



# 1. INTRODUCTION

## Background

- 1.1 | This Strategy (RDS-2014) is an update of the “Railway Development Strategy 2000” (RDS-2000). The RDS-2014 aims at providing a framework for planning the future expansion of Hong Kong’s railway network up to 2031.
- 1.2 | The RDS-2014 is formulated on the basis of the findings of the consultancy study on the Review and Update of the “Railway Development Strategy 2000” (the Study) conducted between March 2011 and January 2014. The Study covered railway schemes identified in the RDS-2000 which have not yet been implemented, and other railway proposals suggested by the Government or members of the public.
- 1.3 | The taking forward of individual proposed railway projects set out in this Strategy will be subject to the outcome of detailed engineering, environmental and financial studies relating to each project, as well as updated demand assessment and availability of resources. As projects other than railways such as initiatives on land production and housing supply as well as hospitals and strategic roads may be equally, if not sometimes more, important to the community, the Government will carefully consider all relevant factors and strike a reasonable balance among various interests of the community when mapping out the way forward for each railway project. In particular, we will critically examine the financial implications of each individual railway project to the Government and

consider the most appropriate implementation programme and financing arrangements for each project. Furthermore, for railway projects which are mainly intended to complement New Development Areas (NDAs) and new housing developments, the implementation timetable for the development areas and new housing developments in question will be an important planning parameter for the railway projects. Prior to the finalisation of any new railway schemes, there will be further public consultation. Against the above background, the feasibility and viability of, as well as the indicative timetable for, implementing the recommended projects may vary with changes in circumstances subsequent to the release of the RDS-2014.

## Policy on Railway Development

- 1.4 | As stated in the 2013 Policy Address, Hong Kong needs a comprehensive and long-term planning for public transport, as it is pertinent to people's livelihood, economic development and protection of the environment. Our overall aim is to develop an affordable, accessible, efficient and environmentally friendly public transport system providing diverse choices for the travelling public.
- 1.5 | We will continue to develop a passenger transportation system centred on public transport with railway as the backbone. Our railway network now carries over 4.5 million passengers per day, accounting for about 40% of all public transport passenger trips. The development of railway transport will not only significantly speed up passenger flow, but will also reduce the reliance on road-based transport (thus the need to build more roads), alleviate road congestion and lessen vehicle-induced air pollution.

The development potential of areas along the railway lines will also be unleashed to facilitate housing and economic developments.

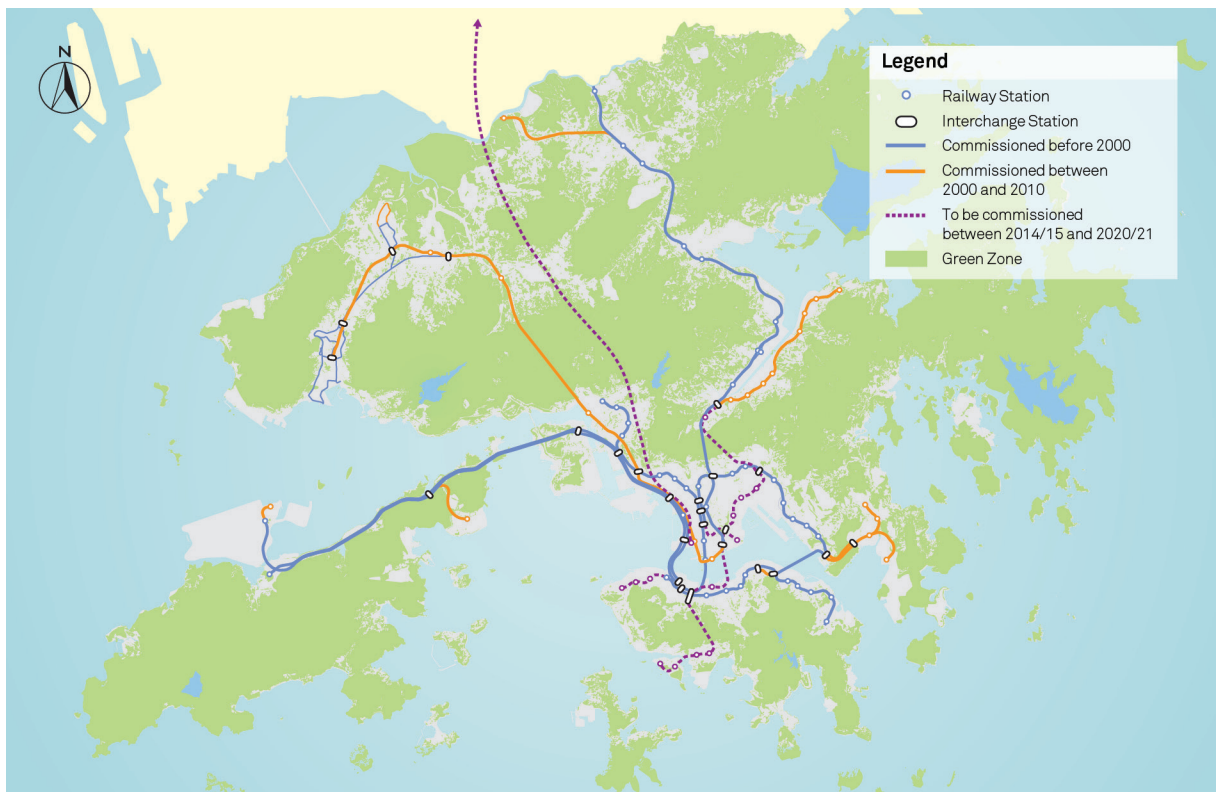
- 1.6 | Railway projects involve huge capital investment, and it typically takes eight to ten years for a railway project to take shape from formulation of ideas, conceptual planning, consultation with stakeholders, detailed design, to actual construction and completion. As they have profound impact on people's livelihood and socio-economic development, we have to be forward-looking and make timely plans for our railway development in future. In planning future railways, transport demand and cost-effectiveness are important considerations, as are the wider socio-economic benefits they will bring about.
  
- 1.7 | The planning framework for the Study is from now until 2031. We have not taken into account those development studies which are still at a preliminary stage by the time the Strategy is finalised. These studies include further development of New Territories North and Lantau; reclamation outside Victoria Harbour; development of rock caverns and underground space. We will continue to keep in view all related future developments and assess the need for appropriate new transport infrastructure including railways to support these latest developments.

## Previous Railway Development Studies

- 1.8 | In 1994, the Government formulated the first Railway Development Strategy to provide a framework for planning the future expansion of Hong Kong's railway network. Based on the needs of different regions, a number of strategic railway schemes were proposed to lay the cornerstone for Hong Kong's railway development and, along with other proposals that were put forth subsequently, these have been implemented over the years.
- 1.9 | The RDS-2000 was announced in May 2000, mapping out a plan for the expansion of Hong Kong's railway network up to 2016 to meet the daily transport needs of the public and to further the policy of using railways as the backbone of our passenger transport system.
- 1.10 | At present, the total length of Hong Kong's railways is approximately 218 km, with 84 railway stations and 68 Light Rail stops. The average daily patronage exceeds 4.5 million, accounting for about 40% of the public transport patronage and approximately 60% of the cross-boundary passenger land trips between the Mainland and Hong Kong.
- 1.11 | Five railway projects are currently at different stages of implementation. They are the West Island Line, the South Island Line (East), the Kwun Tong Line Extension, the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Hong Kong Section), and the Shatin to Central Link. Based on the latest assessment, these lines are expected to be commissioned in succession between the end of 2014/ early 2015 and 2020/2021.



1.12| With these new lines, areas inhabited by more than 70% of the population in Hong Kong will be brought into the railway catchment areas. The anticipated rail share<sup>1</sup> of local public transport trips will increase to 43% (see **Figure 1**).

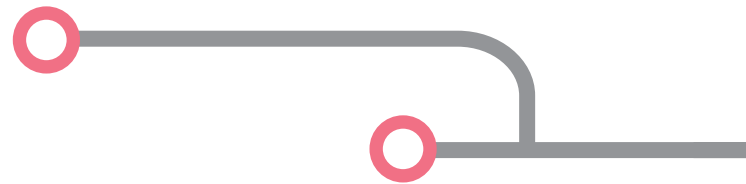


**Figure 1: Hong Kong's Railway Network in 2021**

<sup>1</sup> Rail share is defined as the use of rail modes (heavy rails, Airport Express, Light Rail and trams) as a proportion of all public transport boardings (including public light buses, ferries, franchised and non-franchised buses, taxis, and the above rail modes).



## The Review and Update of the Railway Development Strategy 2000



## 2. THE REVIEW AND UPDATE OF THE RAILWAY DEVELOPMENT STRATEGY 2000

2.1 | In the light of the changing needs of the community and the latest planning parameters, the Government carried out the Review and Update of the “Railway Development Strategy 2000” to examine how best to map out our future railway development blueprint up to 2031 to facilitate the commencement of relevant detailed studies of individual projects in a timely manner.

### Objectives of the Study

2.2 | On the basis of the RDS-2000, the consultancy study examined the needs of the future railway network to fulfill the following objectives -

- (a) to cover more areas and provide railway service to more people;
- (b) to enhance the accessibility and connectivity of major infrastructure and NDAs;
- (c) to relieve bottlenecks of the railways and trunk roads;
- (d) to unleash or enhance the potential for developments and redevelopments along the railway lines; and
- (e) to improve network robustness<sup>2</sup>.

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<sup>2</sup> Network robustness (or operational resilience) is the ability of the railway system to operate satisfactorily in the event of unscheduled service disruptions to specific parts of the network. It can be improved by providing operationally-independent railway route options so that, if the train service of a particular route is delayed or unavailable, the affected passengers can take an alternative route.

- 2.3 | We consider that any railway proposal must -
- cause minimal disruption to the existing network and impact on the local communities and the environment;
  - use proven technology to deliver the desired results; and
  - be affordable and cost-effective.

### Planning Context

- 2.4 | Railways now account for around 40% of the passenger trips in the local public transport sector and about 60% of cross-boundary passenger land trips. They are an integral component of our transport system and vital to the sustainability of economic, social and land use development in Hong Kong. This section provides an overview of the planning parameters and social trends which may affect the future demand for railway service.

### Population and employment levels

- 2.5 | The Second Railway Development Study was conducted in the late 1990s. Since 2000, local population growth has slowed considerably, with a recorded average growth rate of 0.6% per annum from 2000 to 2012. A comparison of the planning data forecasts used in the RDS-2000 and RDS-2014 is presented in **Table 1**.

**Table 1 : Comparison of the planning data forecasts used in the RDS-2000 and RDS-2014**

	RDS-2000 <sup>1</sup>			RDS-2014 <sup>2</sup>			
	Actual	Projected		Actual	Projected		
Year	1996	2011	2016	2009	2016	2021	2031
Local Population (Millions)	6.21	8.34	8.93	7.00	7.44	7.80	8.46
Local Employment (Millions)	2.98	4.17	4.37	3.35	3.55	3.65	3.70

**Sources of data:**

- <sup>1</sup> Extracted from the findings of the Second Railway Development Study in 2000.
- <sup>2</sup> Local population and employment data for the RDS-2014 are extracted from the 2009-based Territorial Population and Employment Data Matrices (TPEDM) of the Planning Department (PlanD). Although the 2011-based TPEDM was released in July 2013, we have not adopted this newer set of data in the RDS-2014. This is because of the long lead time required to re-run the transport model, and because we think it desirable to report to the community soonest on the proposed way forward for the new railway proposals. Notwithstanding this, there should be no material impact on our broad assessment of the railway proposals and the recommendations in the RDS-2014. In any case, updated planning data will be adopted when detailed planning for individual railway projects is conducted.

- 2.6 | The population and employment forecasts as well as land use planning for Hong Kong are key drivers of public transport demands. Meanwhile, transport forecasts in terms of the frequency and choice of trip making are influenced by the changes in the demographic breakdown. For example, subject to policy drivers, an ageing population would typically result in a smaller workforce and a larger number of retired people, leading to a decrease in work-related trips, relatively lower travel demand in the peak hours, and higher travel demand for social activities in the non-peak hours.
- 2.7 | Subject to the findings of the ongoing planning studies<sup>3</sup>, the forecasts show that the highest population and employment growth will occur in the western New Territories, followed by the eastern New Territories and then the urban areas. Such trends will inevitably affect the number and pattern of passenger trips across different districts. While several railway lines are currently under construction, further expansion of the railway network in the urban areas is subject to spatial constraints. That said, extending existing railway lines, adding new stations or building parallel lines will help improve the railway service in some urban areas not currently served by the railway. With the active planning of NDAs, it is worthwhile to explore new major regional railway corridors with a primary focus on serving the New Territories.

<sup>3</sup> These studies include the “North East New Territories New Development Areas Planning and Engineering Study”, “Hung Shui Kiu New Development Area Planning and Engineering Study” and “Planning and Engineering Study on the Remaining Development in Tung Chung – Feasibility Study”.

## Land use planning

- 2.8 | The “Hong Kong 2030: Planning Vision and Strategy” (HK2030) was announced in 2007. It presents a long-term spatial planning framework to guide the development and provision of major infrastructure, with a view to:
- providing adequate and steady land supply to cope with the social and economic developments;
  - promoting sustainable development by seeking to optimise the available development opportunities through the use of brownfield land and the opening up of greenfield land for development; and
  - continuing with rail-based development to shape a more balanced territorial development pattern and to balance conservation and development.
- 2.9 | The HK2030 proposes seizing the development opportunities of the built-up areas and the existing new towns, and prioritising the development of NDAs in Hung Shui Kiu, Kwu Tung North, Fanling North and Ping Che/Ta Kwu Ling. These would alter the planning circumstances of the northern New Territories and the demand for railway service.
- 2.10 | As stated in the 2014 Policy Address, increasing land supply is fundamental to addressing Hong Kong’s housing needs, as well as our continued social and economic developments. In the short to medium terms, the Government is stepping up its efforts to increase land supply through optimising the use of developed land by on-going land use reviews and

increasing development intensity as appropriate, etc. In the longer term, the Government will develop new land extensively through developing NDAs and new town extensions in the northern and northwestern parts of the New Territories, developing Lantau, exploring further development potential in the New Territories North, pursuing reclamation outside Victoria Harbour, exploring development of rock caverns and underground space, etc. Amongst these initiatives, the NDAs at Kwu Tung North and Fanling North, Hung Shui Kiu NDA, Yuen Long South development and Tung Chung New Town extension are being taken forward or investigated in full steam. Other initiatives, including the overall development of Lantau as well as the proposed Artificial Islands in Central Waters, are at different planning stages. The objective is to build up a land reserve for Hong Kong's sustainable development and to respond more flexibly and timely to present and future needs.

- 2.11| In addition, as announced in the 2014 Policy Address, the Government has decided to partially lift the development moratorium at the south of Pok Fu Lam, i.e. the area close to Wah Fu Estate, for public housing development and the future redevelopment of Wah Fu Estate. Other measures include increasing the maximum domestic plot ratios allowed in different “density zones” as appropriate. This Strategy takes into account the best available information regarding all these initiatives at the time of writing.



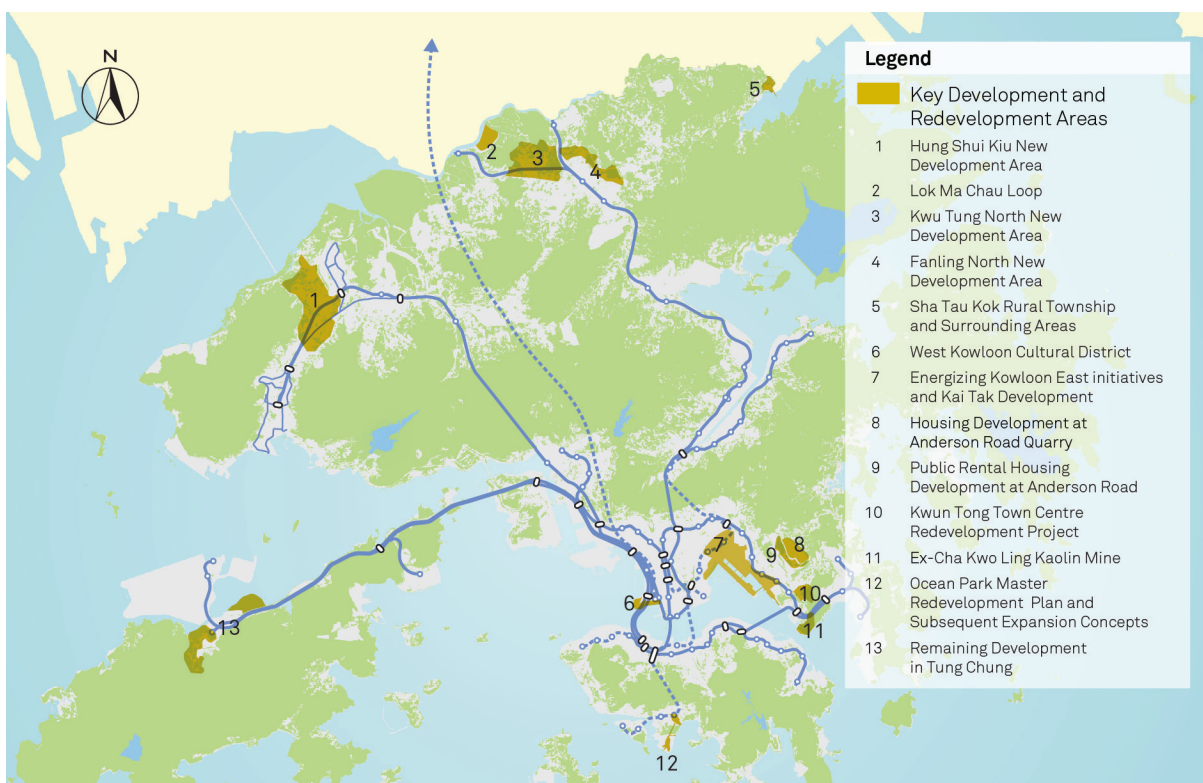
2.12| Given the fast-changing social, economic and planning environment as well as the rapid pace of development, we will take the latest land use planning into account when taking forward individual railway proposals<sup>4</sup>.

2.13| Apart from the aforementioned land use planning, we have also taken into consideration other development and redevelopment projects (refer to **Figure 2**) that were put forward after the publication of the RDS-2000. They include -

- West Kowloon Cultural District;
- Energizing Kowloon East initiatives and Kai Tak Development;
- Lok Ma Chau Loop;
- Kwun Tong Town Centre Redevelopment Project;
- Public Rental Housing Development at Anderson Road;
- Housing Development at Anderson Road Quarry;
- Remaining Development in Tung Chung;
- Ex-Cha Kwo Ling Kaolin Mine;
- Sha Tau Kok Rural Township and Surrounding Areas; and
- Ocean Park Master Redevelopment Plan and Subsequent Expansion Concepts.

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<sup>4</sup> The Chief Executive announced in the 2014 Policy Address that the Government would commence the Preliminary Feasibility Study on Developing the New Territories North. The Study will include re-planning of the Ping Che/ Ta Kwu Ling NDA. The Government would also initiate strategic studies on artificial islands in central waters between Hong Kong Island and Lantau Island for the development of the East Lantau Metropolis. These proposals have not been taken into account in the formulation of this Strategy, given their very preliminary nature.



**Figure 2: Key Development and Redevelopment Areas**

2.14] Since the development parameters evolve from time to time, the above list is by no means exhaustive. In broad terms, the implication of these projects is that they will create additional population and employment opportunities in various districts. Major leisure and tourism facilities may also attract an appreciable number of visitors and thus affect the long-term transport demand. While our committed railway projects are able to accommodate the transport demand generated by some of these projects, it is necessary to keep in view any changes in the development parameters and new proposals, and take them into account when individual railway proposals are taken forward.

### **Cross-boundary travel**

- 2.15| With the increasingly close ties between Hong Kong and the Mainland, the demand for cross-boundary travel has been on the rise and is expected to grow further. Currently, cross-boundary travel in the Pearl River Delta mainly relies on vehicular, ferry and railway services, with the railway having the largest market share.
- 2.16| Having reviewed the consultant's findings, we expect that the existing and committed cross-boundary transport infrastructure should be sufficient to cater for the demand up to 2031. There is no imminent need to consider implementing any new cross-boundary transport infrastructure at this stage. We will monitor the changes in the cross-boundary traffic demand, so that the need for planning any such infrastructure can be studied in time.

### **Direction for Updating the Railway Development Strategy**

- 2.17| In terms of coverage, connectivity and capacity, upon completion of the five new railway projects currently under construction (i.e. the West Island Line, the South Island Line (East), the Kwun Tong Line Extension, the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Hong Kong Section) and the Shatin to Central Link), the railway network will be largely adequate to meet the potential additional demand in the short to medium terms -

- (a) Coverage:** The coverage of the existing and committed railway network will be extensive, providing railway service to most of the major residential and commercial areas. Most people can use the railway service by accessing the railway stations on foot or with the use of feeder services. With the completion of the five railway projects under construction, the railway network will cover areas inhabited by more than 70% of the local population;
- (b) Connectivity:** Compared to the New Territories, the urban areas (Kowloon and Hong Kong Island) have more extensive railway coverage due to the history of railway development in Hong Kong, providing connection to densely located destinations and allowing inter-regional trips without significant detours. With the total length of the railways in Hong Kong reaching more than 270 km upon the completion of the five railway projects under construction, the railway network will be able to connect different parts across the territory more efficiently; and
- (c) Capacity:** The overall capacity of the railway network will increase considerably upon the completion of the five committed railway projects and is expected to be generally sufficient to meet the transport demand in the short to medium terms. However, bottlenecks may appear in some urban sections of the railway network in the peak hours. In the longer term, consideration should be given to enhancement of the existing infrastructure and construction of parallel railway lines.

- 2.18| Against the above observations, there is a need to consider enhancing the existing railway network with smaller-scale projects in order to optimise the coverage of railway lines (e.g. Tuen Mun South Extension) and provide relief to the present and potential bottlenecks (e.g. North Island Line). Meanwhile, the proposed NDAs in the New Territories (namely the NDAs at Kwu Tung North and Fanling North, Hung Shui Kiu NDA, and Tung Chung New Town extension) might require major regional railway corridors to link up the northwestern New Territories and northeastern New Territories.

### Public Engagement

- 2.19| A two-stage Public Engagement (PE) exercise was conducted to collect public views of the future development of our railway network. The Stage 1 PE exercise took place between April and July 2012, and focused on three major regional railway corridors schemes (the Hong Kong-Shenzhen Western Express Line, Northern Link and Coastal Railway between Tuen Mun and Tsuen Wan). The Stage 2 PE exercise from February to May 2013 focused on seven local enhancement schemes (North Island Line, Siu Sai Wan Line, South Island Line (West), Tuen Mun South Extension, Tung Chung West Extension, Hung Shui Kiu Station and Kwu Tung Station) for optimisation of the railway network.

- 2.20| In putting forth these proposals for public consultation, the consultant had reviewed the broad development context and transport demand at the outset with the aim of identifying the strategic requirements. After evaluating the priority schemes recommended in the RDS-2000, other railway schemes proposed by the public or the Government, as well as long-term railway possibilities against a range of criteria (including planning needs, engineering and operational feasibility, environmental impact, financial viability and cost-effectiveness), the consultant selected the ten railway proposals which were considered worthy of public discussion.
- 2.21| In the course of the consultation, eight public forums and some 40 meetings were held with various committees and organisations, including the Subcommittee on Matters Relating to Railways of the Legislative Council Panel on Transport, various District Councils, Transport Advisory Committee, Heung Yee Kuk, professionals, academics and the business sector. In addition, over 11 600 written submissions were received through various channels, including the study website, post, email and fax. We also received many verbal comments at the aforementioned public forums, focus group meetings, and through the hotline.

2.22| The Government’s initiative to review the railway development strategy and the railway proposals were generally welcomed by the public. Many looked forward to an early implementation programme. The majority agreed that land uses and railway development should be planned in an integrated manner, and that railways should continue to serve as the backbone of the passenger transport system in Hong Kong. There were mixed views on some of the individual proposals, which are presented in the next section. For more details of the outcome of the PE exercise, please refer to the PE Report on the “Our Future Railway” website at <http://ourfuturerailway.hk>.



# The Strategy – Our Future Railway Network





### 3. THE STRATEGY – OUR FUTURE RAILWAY NETWORK

3.1 | The RDS-2014 sets out the blueprint for territory-wide railway development based on the findings and final recommendations of the consultancy study and the views collected during the PE exercise. In formulating this Strategy, a wide range of factors, including transport planning, land use planning, development needs, economic return and other benefits, environmental impact and engineering feasibility, have been considered.

3.2 | The various components of the preferred railway network are described in the ensuing paragraphs and illustrated in **Figure 3**. On completion of all the recommended schemes, the network will include the following new railway lines, extensions and stations:

- (a) **Northern Link and Kwu Tung Station** – a major regional line formed by linking the Kam Sheung Road Station on the West Rail Line to a new station at Kwu Tung on the Lok Ma Chau Spur Line.
- (b) **Hung Shui Kiu Station** – a new station on the West Rail Line between the existing Tin Shui Wai Station and Siu Hong Station.
- (c) **Tung Chung West Extension** – formed by extending the Tung Chung Line westward with a new station at Tung Chung West.
- (d) **Tuen Mun South Extension** – formed by extending the West Rail Line southward from the Tuen Mun Station to a new station at Tuen Mun South.

- (e) **East Kowloon Line** – a new line running in the northern East Kowloon area connecting the Diamond Hill Station of the Kwun Tong Line (and the future Shatin to Central Link) and the Po Lam Station of the Tseung Kwan O Line.
- (f) **South Island Line (West)** – a new line linking the South Island Line (East) to the West Island Line.
- (g) **North Island Line** – a new railway line on the northern shore of the Hong Kong Island formed by extending the Tung Chung Line eastward and the Tseung Kwan O Line westward.



**Figure 3: Hong Kong's Railway Network in 2031**

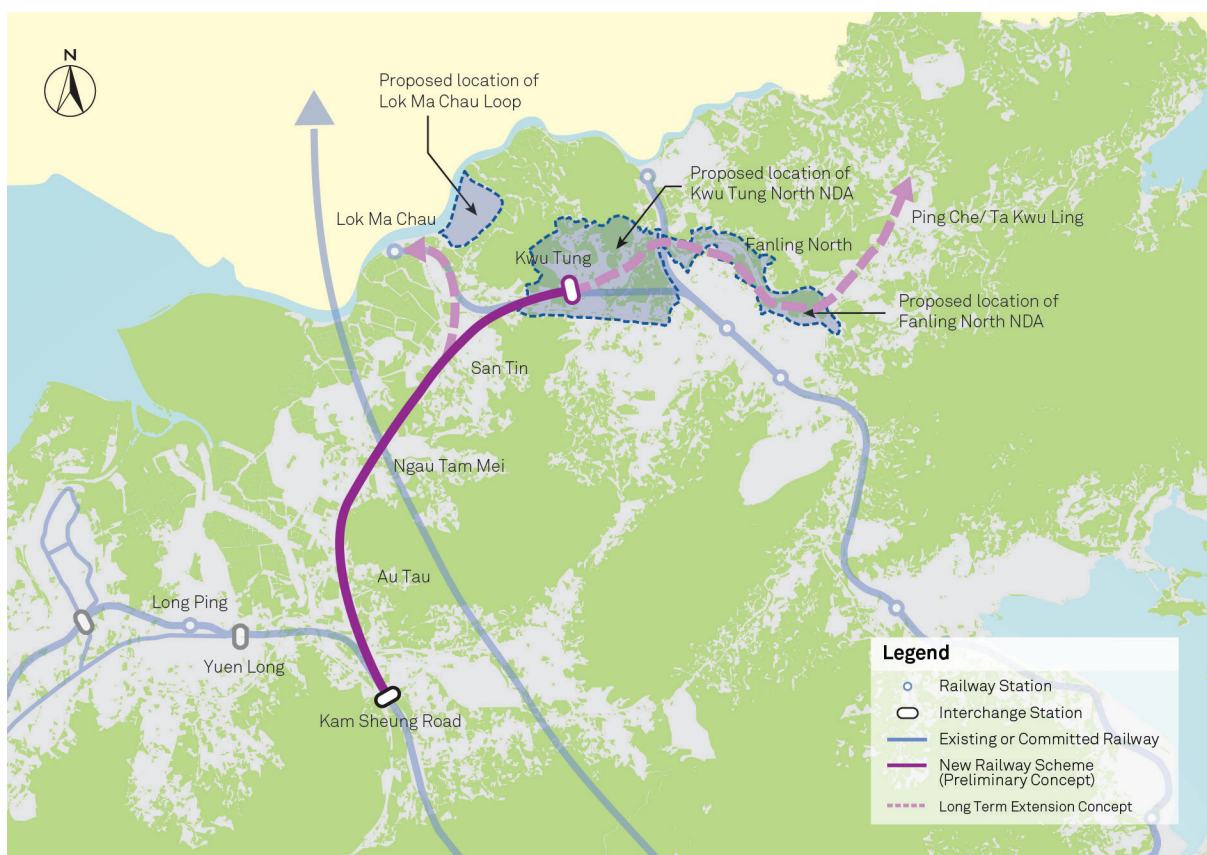
## (a) Northern Link and Kwu Tung Station

3.3 | The Northern Link will be a railway line between the Kam Sheung Road Station on the existing West Rail Line (which will form part of the future East West Corridor<sup>5</sup>: see **Figure 4**) and a new station at Kwu Tung on the Lok Ma Chau Spur Line (see **Figure 5**). The Northern Link will have a route length of about 10.7 km, and provide shuttle service between the two terminal stations (i.e. Kam Sheung Road Station and Kwu Tung Station). Passengers will be able to interchange at the Kam Sheung Road Station with the East West Corridor, and at the Kwu Tung Station with the Lok Ma Chau Spur Line.



**Figure 4: The Future East West Corridor**

<sup>5</sup> Formed by the West Rail Line, Tai Wai to Hung Hom Section of the Shatin to Central Link and Ma On Shan Line.



**Figure 5: Preliminary Conceptual Scheme of the Northern Link (including Kwu Tung Station)**

### Improve network robustness and east-west connectivity

**3.4 |** The Northern Link will connect the East Rail Line and the West Rail Line, forming a loop in the northern New Territories. This will allow residents in the New Territories to have more route choices without straining the road network. As the Northern Link can improve the east-west connectivity in the northern New Territories, residents in the area showed strong support for the scheme in the PE exercise.

### **Divert passenger flow of the East Rail Line**

- 3.5 | Apart from providing domestic railway service for travel between various new towns in the eastern New Territories and the urban area, the East Rail Line provides connection to the Lo Wu Control Point and Lok Ma Chau Spur Line Control Point. It also offers the inter-city through-train service between Hong Kong and the Mainland. It has the highest patronage among all local railway lines.
- 3.6 | We are constructing the Shatin to Central Link and the Guangzhou-Shenzhen-Hong Kong Express Rail Link (Hong Kong Section), which will respectively relieve the pressure on the domestic service in the southern portion of the East Rail Line as well as the cross-boundary service. The Northern Link can help divert some of the railway traffic from the northeastern New Territories (including that arising from the proposed NDAs), bringing about a further redistributive effect.

### **Serve the NDAs in the northern New Territories**

- 3.7 | The “North East New Territories New Development Areas Planning and Engineering Study” was conducted jointly by PlanD and the Civil Engineering and Development Department (CEDD) to ascertain the feasibility and development direction of the NDAs in the northeastern New Territories as identified in the HK2030. The study has established a planning and development framework for the Kwu Tung North and Fanling North NDAs to meet long-term housing, social, economic and environmental needs.

**3.8 |** The latest planning parameters as indicated in the Kwu Tung North and Fanling North Outline Development Plans encompass a relatively high development intensity in the Kwu Tung North and the Fanling North NDAs, with Kwu Tung North having a population of 105 500 and 31 200 jobs, and Fanling North having a population of 71 400 and 6 500 jobs upon full development in 2031. A key design concept of the NDAs is to promote railway-based public transport development. Under the railway-based development approach, about 80% of the population in the Kwu Tung North NDA would reside within 500 m of the proposed Kwu Tung station, which would be the focal point of the public transport hub at the proposed Kwu Tung town centre. With the support of other short-distance road-based feeder services, the usage of the Kwu Tung Station and railway service may increase further.

### **Enhance cross-boundary movements**

**3.9 |** At present, residents in the western New Territories mainly rely on the services of franchised buses, minibuses and short-haul cross-boundary coaches to reach the Lok Ma Chau Boundary Control Point, Lok Ma Chau Spur Line Control Point or Shenzhen Huanggang Port for cross-boundary travel. So far, these services are capable of meeting the related transport demand.

**3.10|** With the anticipated development and population growth in the northwestern New Territories (such as the potential developments in Hung Shui Kiu, Yuen Long and Tuen Mun), there will likely be a further

increase in the demand for cross-boundary movements. The Northern Link is expected to facilitate residents along the West Rail Line, especially those in the New Territories, to travel across the boundary via the Lok Ma Chau Spur Line Control Point and Lo Wu Control Point, reducing reliance on road-based transport and alleviating the associated congestion and pollution issues. We will reserve land and make design provisions for the long-term possibility of adding a bifurcation to connect the Kam Sheung Road Station to the Lok Ma Chau Station direct, subject to the growth in the cross-boundary transport demand.

- 3.11| In the PE exercise, the public generally supported the early implementation of the Northern Link. The majority agreed that the Kwu Tung Station should be built to cater for the transport demand arising from the proposed Kwu Tung North NDA. There was also general support for the construction of the station in advance of development in the area. The “North East New Territories New Development Areas Planning and Engineering Study” indicates that the construction works for the Kwu Tung North NDA are targeted to commence in 2018, with the first population intake in 2023 and completion of the entire NDA by 2031. Subject to the actual implementation of the NDA, an indicative implementation window from 2018 to 2023 for the Northern Link and Kwu Tung Station is therefore recommended for planning purpose. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development

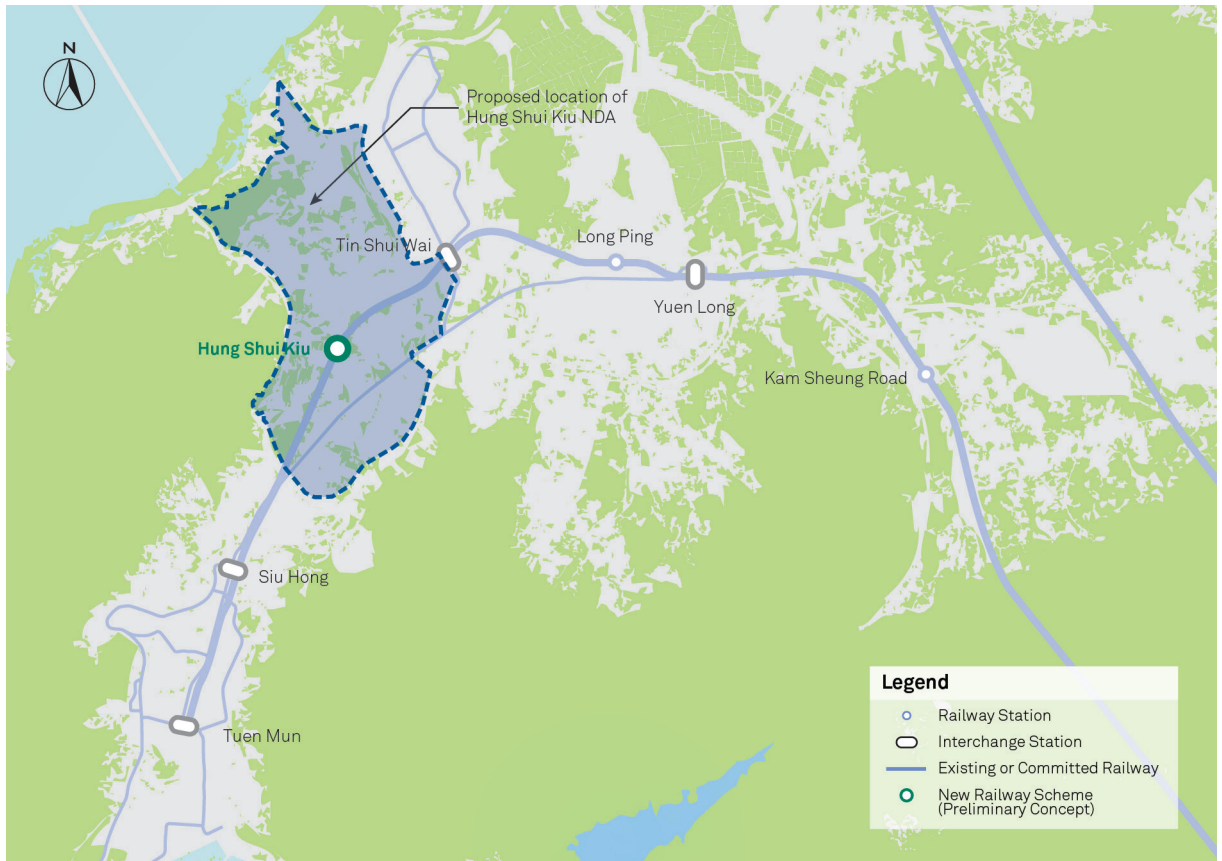
proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.

- 3.12| In implementing the Northern Link and Kwu Tung Station, we will carefully assess and mitigate the impact on the local population in the rural area as well as ecologically-sensitive places such as the Mai Po Nature Reserve, fishponds, wetlands, egrettries and farmlands.
- 3.13| The “Preliminary Feasibility Study on Developing the New Territories North” conducted jointly by PlanD and CEDD commenced in January 2014. The study will examine and make recommendations on potential developments in New Territories North. In planning for the Northern Link, we will reserve land and make design provisions for possible intermediate stations at Au Tau, Ngau Tam Mei and San Tin to serve the potential developments in future.
- 3.14| Moreover, there is a need to retain flexibility for extending the Northern Link to serve the potential developments in the New Territories (such as Fanling North, Ping Che/ Ta Kwu Ling/ Hung Lung Hang) in future, taking into account the policy initiatives of developing New Territories North to include a new town and employment clusters which are being examined in the study on New Territories North.



## (b) Hung Shui Kiu Station

- 3.15| Hung Shui Kiu Station will be located between the Tin Shui Wai Station and the Siu Hong Station on the West Rail Line, primarily to serve the future Hung Shui Kiu NDA (see **Figure 6**).



**Figure 6: Preliminary Conceptual Scheme of the Hung Shui Kiu Station**

- 3.16| PlanD and CEDD jointly commissioned the “Hung Shui Kiu New Development Area Planning and Engineering Study” in August 2011 to formulate a feasible land use framework for the Hung Shui Kiu NDA.
- 3.17| A key design concept underlying the Hung Shui Kiu NDA project is to make use of the existing West Rail Line as the backbone of passenger

transport system with the Tin Shui Wai Station in the east and the proposed Hung Shui Kiu Station in the proposed town centre in the west.

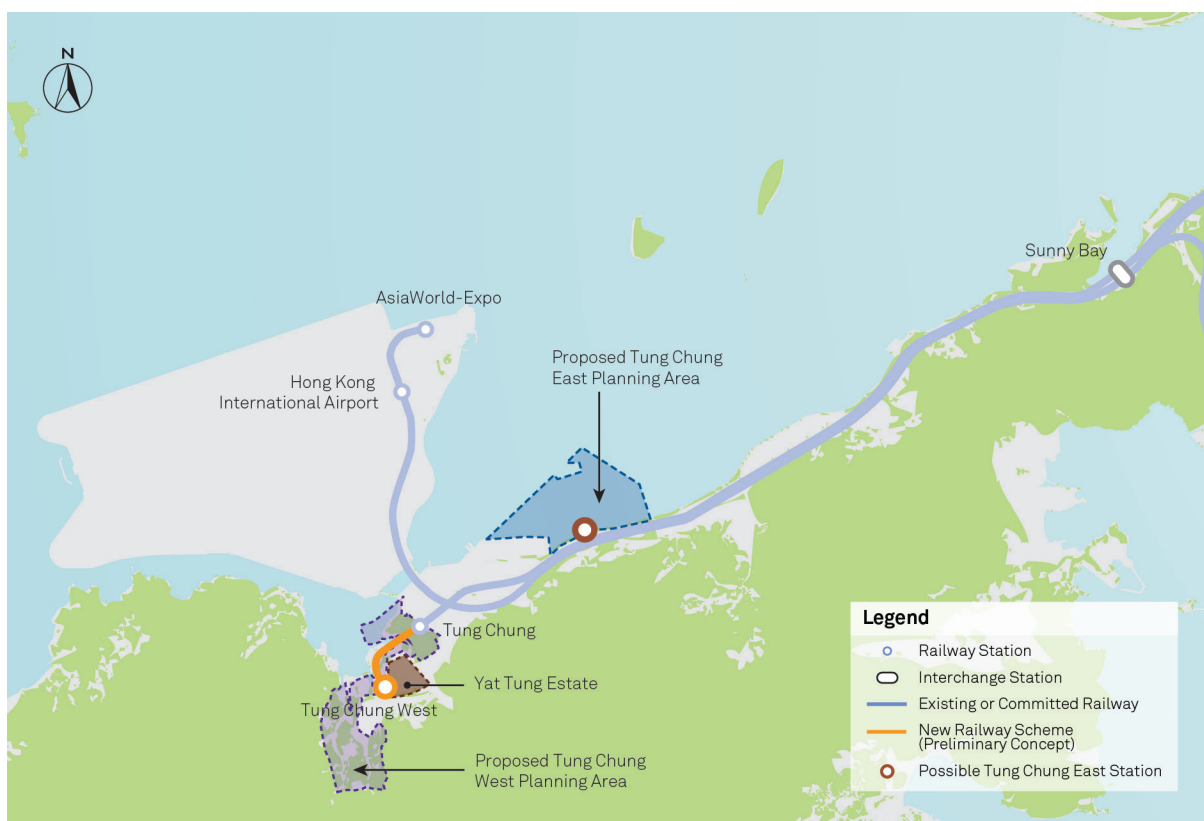
- 3.18| Based on the Preliminary Outline Development Plan released in the Stage 2 Community Engagement exercise in July 2013 under the “Hung Shui Kiu NDA Planning and Engineering Study”, the Hung Shui Kiu NDA would accommodate a total population of about 218 000 and provide about 100 000 employment opportunities by 2034, requiring timely provision of the supporting transport infrastructure. It is hoped that the proposed Hung Shui Kiu Station would allow passenger access to Hong Kong’s Central Business District (CBD) from Hung Shui Kiu within 30 minutes. To further capitalise on the opportunity in the vicinity of the proposed Hung Shui Kiu Station, PlanD is considering to expand the commercial zone and increase its development intensity to reinforce the proposed regional office and retail node in the northwestern New Territories around the new station. The refined proposals will be reflected in the Recommended Outline Development Plan being formulated under the study. The Hung Shui Kiu Station will be a crucial transport infrastructure in the Hung Shui Kiu NDA.
- 3.19| Site formation works for the Hung Shui Kiu NDA are currently expected to start in 2020, with the first intake of population in 2024 and full occupation by 2034. As with the Kwu Tung Station, the public in general concurred that the Hung Shui Kiu Station should be completed prior to the population build-up in the proposed Hung Shui Kiu NDA to address the associated transport needs. To tie in with the first population intake, an indicative implementation window from 2021 to 2024 is recommended for

planning purpose. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.

3.20| Although the Hung Shui Kiu Station would attract residents in Hung Shui Kiu to use the West Rail Line, some passengers in other parts of the northwestern New Territories may choose to use road-based transport to travel to and from the urban area because of the slightly lengthened journey time (due to the addition of the Hung Shui Kiu Station). The actual impact would hinge on the provision of road-based transport modes in the area, as well as the population distribution and growth in Hung Shui Kiu.

### (c) Tung Chung West Extension

3.21| The Tung Chung West Extension will extend the Tung Chung Line westward by 1.5 km from its existing terminus, Tung Chung Station, to a new station in Tung Chung West. The new station is planned to serve the existing Yat Tung Estate and other potential developments nearby (see **Figure 7**).



**Figure 7: Preliminary Conceptual Scheme of the Tung Chung West Extension and possible Tung Chung East Station**

3.22| Currently, the Tung Chung New Town has a population of about 82 000, whereas Tung Chung West is the home to approximately 40 000 residents. The development in Tung Chung West is limited to the vicinities of Yat Tung Estate, with the remaining parts being rural villages, fallow land and open countryside. A number of bus routes are currently available in the district, including feeder routes to Tung Chung Station as well as those travelling to and from the urban areas, to satisfy the different transport needs. The local communities made requests in the PE exercise for the extension of the Tung Chung Line to improve the accessibility of Yat Tung Estate.

- 3.23| PlanD and CEDD are jointly conducting the “Planning and Engineering Study on the Remaining Development in Tung Chung – Feasibility Study” (“Tung Chung New Town Extension Study”), which incorporates Tung Chung West into the potential new town extension area for further development. A Recommended Outline Development Plan for the further development of the Tung Chung New Town is being developed taking account of the housing demand, public aspirations and the findings from the planning and engineering assessment. Meanwhile, the Housing Department is planning to construct more public rental housing in Area 39 of Tung Chung West.
- 3.24| With clear support from the public in the PE exercise, the timing for implementing this extension should be coordinated with the proposed new developments in the Tung Chung West area. The first population intake of the housing development is expected to be in 2024. An indicative implementation window from 2020 to 2024 for planning purpose is considered compatible with the latest development programme of the Tung Chung New Town. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.

3.25| In the longer term, according to the initial land use options disseminated in Stage 2 PE of the Tung Chung New Town Extension Study in mid-2013, an additional population of up to 110 000 is proposed on the future reclamation in the Tung Chung East area. As the proposed development is still under planning, this Strategy does not include any railway facilities to serve this area. However, if the proposed development is confirmed at a later stage, the railway would be the key transport infrastructure to support this development and a new Tung Chung East Station has been proposed under the Tung Chung New Town Extension Study (see **Figure 7**). As the proposed Tung Chung East Station will involve modification to the existing Tung Chung Line, detailed investigation will be conducted to further confirm its feasibility in future.

#### (d) **Tuen Mun South Extension**

3.26| The Tuen Mun South Extension will extend the West Rail Line by about 2.4 km from the existing Tuen Mun Station to Tuen Mun South (see **Figure 8**).

3.27| Tuen Mun is the most populated new town in the northwestern New Territories with a population of about 490 000. The area near Tuen Mun Ferry Pier is one of the major residential areas in the district, which is currently the home of approximately 90 000 residents.

3.28| At present, Tuen Mun South residents intending to use the West Rail Line usually travel to the Tuen Mun Station by Light Rail or feeder bus. At the same time, a range of bus routes connect Tuen Mun to different railway

stations in the urban areas and various parts of the Hong Kong Island via the Western Harbour Crossing direct. Although the existing road-based transport modes can provide convenient point-to-point service for Tuen Mun South residents, there have been requests for extension of the West Rail Line to serve the vast population in the area.



**Figure 8: Preliminary Conceptual Scheme of the Tuen Mun South Extension**

3.29| The Tuen Mun South Extension mainly serves to improve railway access to the community south of the current Tuen Mun town centre (near Wu King Estate, Siu Hei Court and Yuet Wu Villa) and connectivity to Tuen Mun Ferry Pier. In addition, the proposed new station would be close

to the Light Rail stops at Tuen Mun Ferry Pier and Siu Hei and allow convenient interchange between Light Rail and the core railway network. Some new development sites in the vicinity have been identified. This proposal earned significant support from the local residents in the PE exercise as it could facilitate them to use the West Rail Line as the main mode of transport.

- 3.30| The present thinking is that the extension will be elevated. Although we have explored the feasibility of constructing the extension underground, the existing infrastructure and the steep gradient from the existing elevated Tuen Mun Station to Tuen Mun South make this option operationally and technically impossible. At the implementation stage, it is necessary to study the visual and landscaping impact created by the elevated extension on the Tuen Mun River Channel, which is a scenic spot in the district, and the residents in the vicinity.
- 3.31| In view of the benefits that this railway line extension could bring to the existing community and some new development sites, an indicative implementation window from 2019 to 2022 is recommended for planning purpose. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.



## (e) East Kowloon Line

3.32| The 7.8-km East Kowloon Line will run along the north Kwun Tong area, connecting the Diamond Hill Station of the Kwun Tong Line (and the future Shatin to Central Link) and the Po Lam Station of the Tseung Kwan O Line (see **Figure 9**), to serve the densely populated areas in Choi Wan, Shun Tin, Sau Mau Ping and Po Tat, as well as the committed major development projects in the area, including the development at Choi Wan Road and Jordan Valley, development at Anderson Road and development at Anderson Road Quarry. At a strategic level, the East Kowloon Line can enhance the overall network robustness by offering an alternative railway route for trips between the Tseung Kwan O area and Kowloon (such that if the train service of the Tseung Kwan O Line is disrupted, the affected passengers can take this alternative route to interchange with the Kwun Tong Line), and by serving as a parallel line to the existing Kwun Tong Line.



**Figure 9: Preliminary Conceptual Scheme of the East Kowloon Line**

- 3.33| The 2011-12 Policy Address announced that a visionary, coordinated and integrated approach should be adopted to expedite the transformation of Kowloon East. The intention is to develop the new Kai Tak Development area, Kwun Tong and Kowloon Bay into an attractive alternative CBD to support Hong Kong’s continuing economic development. With this objective, the Government is pushing ahead the initiatives of Energizing Kowloon East, seeking to transform the old industrial areas in Kwun Tong and Kowloon Bay into commercial and business uses.

- 3.34| Under the Energizing Kowloon East initiative, two Action Areas in Kowloon Bay and Kwun Tong have been identified for development. The Kowloon Bay Action Area will become a major activity node for comprehensive development including office, retail, hotel, public arts, cultural and creativity related uses. The Kwun Tong Ferry Pier Action Area, together with the former Kai Tak runway tip and the water body enclosed between them, will be developed as Kai Tak Fantasy, which will become a world-class tourism and entertainment hub. They will have a synergy effect and bring vibrancy and diversity to the Kowloon East area. Together with the commercial and office developments in Kai Tak, Kowloon East is anticipated to become a major commercial and activity hub in Hong Kong.
- 3.35| Furthermore, a number of existing and committed major development projects in the vicinity of the Kowloon East area, including the development at Choi Wan Road and Jordan Valley, development at Anderson Road and development at Anderson Road Quarry, are expected to attract new population and economic activities. Based on the latest planning data, the population to be accommodated in the development at Anderson Road would be about 48 300 by 2017/18, with the first intake in 2015/16. As for Anderson Road Quarry, the site formation is planned to be completed in 2019/20, after which the housing development in the area will be completed in a few years' time to accommodate a population of about 25 000. Hence, upon the completion of these development projects, the population of the Anderson Road area is expected to increase by about 73 000 by 2026, adding to the existing population of about 300 000 in the uphill areas in north Kwun Tong.

- 3.36| The East Kowloon Line scheme was explored and developed after the PE exercise in the light of assessed transport needs associated with the major development projects, the growing pressure on the road network (which has limited capacity for expansion) in the north Kwun Tong area and the strong demand from the public. More specifically, the East Kowloon Line will not only support the residential developments in the uphill areas, but also reduce the reliance on road-based transport. Without this new railway line, passengers who wish to use the railway would need to take other transport modes to a station nearby, such as the Choi Hung Station and the Kwun Tong Station. We anticipate that the population growth in the uphill areas would further aggravate the congestion of the road network that stretches from the uphill areas to the business zones in Kowloon East (especially at peak hours). The East Kowloon Line will serve to divert traffic flows from the road network, such that vehicular bottlenecks will less likely appear. This will enhance the overall transport capacity of Kowloon East.
- 3.37| Having analysed several alternative alignments of the East Kowloon Line, we consider that the current proposal is the most practicable, given the hilly topography along the corridor. An indicative implementation window from 2019 to 2025 is recommended for planning purpose to support the planned developments in the Anderson Road/Sau Mau Ping area. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.

## (f) South Island Line (West)

3.38| The South Island Line (West), which has a total route length of 7.4 km, will serve the western and southern parts of the Hong Kong Island (see **Figure 10**), extending the railway coverage to new catchment areas in Aberdeen, Wah Fu, Cyberport and Pok Fu Lam.



**Figure 10: Preliminary Conceptual Scheme of the South Island Line (West)**

### **Address the growing transport demand in the western part of the Southern District**

- 3.39| The residential and commercial nodes in the Southern District mainly stretch along two clusters with one on the west, namely Pok Fu Lam, Cyberport, Wah Fu and Aberdeen, and another on the east, namely South Horizons, Lei Tung Estate, Wong Chuk Hang and Ocean Park. Intended to alleviate the congestion of the Aberdeen Tunnel, the South Island Line (East) now under construction is expected to serve a residential and working population of approximately 350 000 in the Southern District by 2016.
- 3.40| The future redevelopment of the Ocean Park is expected to stimulate new developments, such as retail shops, offices and hotels, in the surrounding areas. Meanwhile, the tourism appeal of the Aberdeen Harbour and nearby Ap Lei Chau Main Street is being enhanced. These are anticipated to generate additional transport demand.
- 3.41| In the long term, given the natural growth of population in the Southern District, particularly near Wah Fu and Aberdeen, the residential population in the western part of the district is estimated to grow to nearly 100 000 by 2031, with the transport demand possibly equivalent to that of the eastern part. As some land in the western part of the Southern District is yet to be developed, the potential development opportunities may prompt a further increase in the number of transport trips.

- 3.42| Concurrently, there are a number of proposals on the future development of the Central and Western District and Southern District, including sustainable tourism development in Wong Chuk Hang and its surrounding areas, conversion of industrial buildings for more suitable commercial uses and redevelopment of the Queen Mary Hospital to serve more patients and a wider community.
- 3.43| The above developments reinforce the need for railway service in the western part of the Southern District to improve the overall accessibility and transport capacity.

#### **Relieve pressure on the road network in the Pok Fu Lam area**

- 3.44| Since the 1970s, development in the Pok Fu Lam area has been subject to the Pok Fu Lam Moratorium, which prohibits any new land sale and lease modification for more intensive development. The Chief Executive announced in the 2014 Policy Address that the Government had decided to partially lift the development moratorium at the south of Pok Fu Lam, i.e. the area close to Wah Fu Estate, for public housing development and the future redevelopment of Wah Fu Estate.
- 3.45| At present, the external traffic of the western part of the Southern District mainly relies on road-based transport modes. Both Pok Fu Lam Road and Victoria Road are key roads connecting the district to the Central and Western District. A number of bus and minibus routes operate along these two roads to serve local residents travelling between Wah Fu/ Aberdeen

and the Central and Western District. On the other hand, areas near Cyberport and Pok Fu Lam adopt a lower development density, and many residents therein travel to the Central and Western District by private cars via Pok Fu Lam Road or Victoria Road. The public transport modes and private cars, which compete for usage of Pok Fu Lam Road and Victoria Road (or the Aberdeen Tunnel if they choose to go southbound), often encounter long queues in peak hours. Because of the hilly environment and steep slopes in the western part of the Southern District, it would be difficult to carry out further large-scale widening works on Pok Fu Lam Road and Victoria Road. The room for increasing the traffic capacity of both roads is very limited.

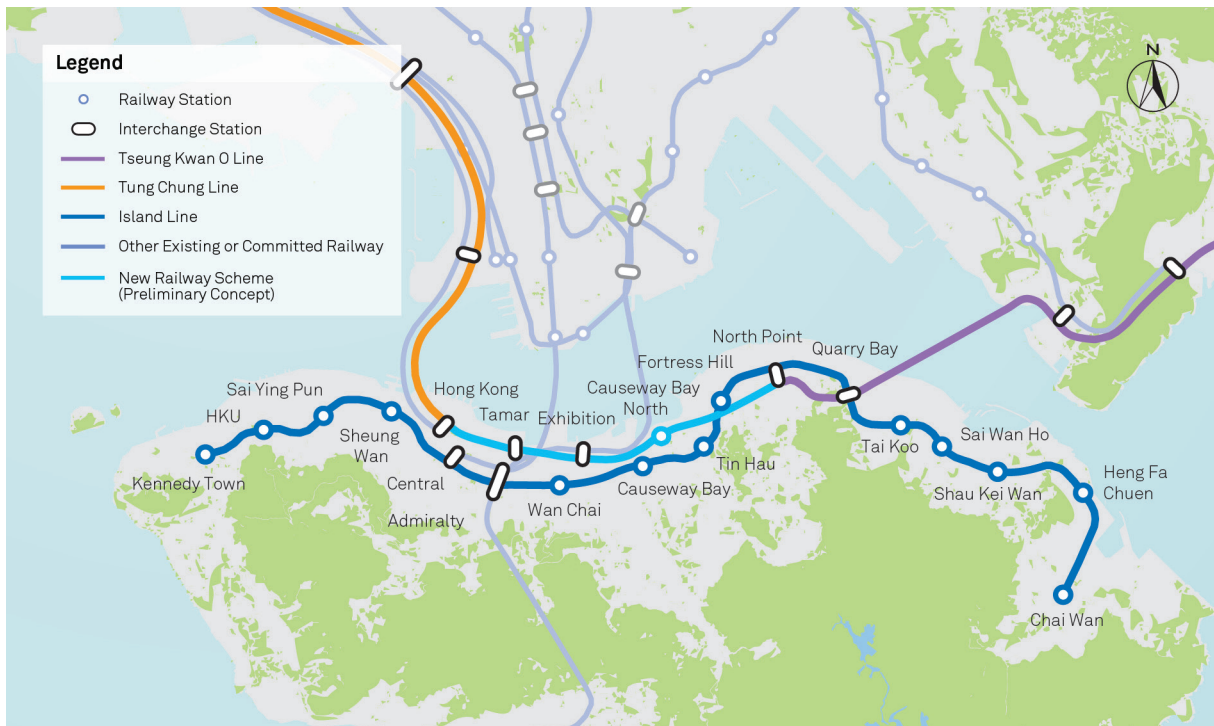
- 3.46| Having regard to the expected growth in population and visitors in the western part of the Southern District, we recommend taking forward the South Island Line (West) to address the emerging transport demand and relieve the pressure on the road network in good time, noting the strong support for this scheme in the PE exercise. By forming a loop with the South Island Line (East) and West Island Line, the South Island Line (West) also has the benefits of improving the robustness of the railway network and acting as an alternative route for the residents in the Southern District.
- 3.47| An indicative implementation window from 2021 to 2026 is recommended for planning the South Island Line (West), subject to the actual programme for the development and redevelopment of public housing in the Wah Fu area as well as the build-up of transport demand. The actual implementation of the project is contingent upon the technical and financial studies as well



as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, in particular the progress of the public housing development at the south of the Pok Fu Lam area (near Wah Fu), and consider how best to optimise the scheme and maximise development potential in the vicinities.

### (g) North Island Line

3.48| The North Island Line will be an extension of the Tung Chung Line and Tseung Kwan O Line along the northern shore of the Hong Kong Island, connecting the vicinities of Tamar, the Hong Kong Convention & Exhibition Centre and Victoria Park (see **Figure 11**) with a total route length of about 5 km. This is essentially the “Interchange” Scheme put forth in the PE exercise. The “Swap” Scheme, which requires the splitting of the existing Island Line into two halves, is not adopted due to its significant disruption to the operation of the Island Line and impact on the travel habits of the users.



**Figure 11: Preliminary Conceptual Scheme of the North Island Line**

### **Divert the harbour-crossing passenger traffic**

**3.49|** At present, the Tsuen Wan Line, the Tseung Kwan O Line and the Tung Chung Line carry passengers to and from the northern shore of the Hong Kong Island across the harbour. However, the usage of these three harbour-crossing railway lines is not uniform – the Tsim Sha Tsui to Admiralty section of the Tsuen Wan Line captures the highest average loading among the three in the morning peak, whereas the loading of the Kowloon to Hong Kong section of the Tung Chung Line remains the lowest despite the lower train frequency. An explanation for the difference is that the Tsuen Wan Line provides direct connection to the two major CBDs in Central and Admiralty, is easily accessible to passengers from both the eastern and western parts of Hong Kong, and runs through the centre of Kowloon.

- 3.50| Meanwhile, the Shatin to Central Link, being the fourth harbour-crossing railway line in Hong Kong, is expected to have the effect of diverting a considerable number of railway passengers from the Tsuen Wan Line.
- 3.51| The North Island Line will provide a fast and convenient route between West Kowloon or the Tseung Kwan O area and the Hong Kong Island with direct connection to the Tamar, Exhibition and Causeway Bay North Stations. It will also facilitate interchange with the future Shatin to Central Link at the Exhibition Station for passengers to cross the harbour. By connecting to more districts on the Hong Kong Island upon integration, the North Island Line will help redistribute the cross-harbour trips among the aforesaid railway lines, such that the cross-harbour flows of the Tsuen Wan Line are expected to decrease whereas those of the Tung Chung Line, the Tseung Kwan O Line and the future Shatin to Central Link are expected to increase.

### **Alleviate the loading of the Island Line**

- 3.52| The Island Line currently serves as the backbone of the passenger transport system on the northern shore of Hong Kong Island providing mass transport capacity to cope with the needs of people who travel between various places on the Hong Kong Island.
- 3.53| The consultant's forecast indicates that the loading of the Island Line may reach some 1.4 million passenger trips per day by 2031 (after the commissioning of the West Island Line, the South Island Line (East), the

Shatin to Central Link, as well as the Central-Wan Chai Bypass and Island Eastern Corridor Link). The current loading on the critical link of the Island Line at the morning peak is near capacity. Indeed, in the PE exercise, many respondents asked for the alleviation of the crowdedness in train cars. There is no room to provide additional train trips under the existing signalling system. Although the upgrading exercise of the signalling system will be completed from 2018 to 2022, any increase in the capacity of the Island Line will likely be modest as it is already run at a relatively high train frequency. While the Shatin to Central Link is expected to increase the carrying capacity of the railway section from Sha Tin to Kowloon, as well as that of existing lines across the harbour, the situation in respect of the Island Line remains to be resolved. The MTR Corporation Limited is expected to take short to medium-term relief measures to mitigate the crowdedness on the Island Line, but the effect will likely be limited.

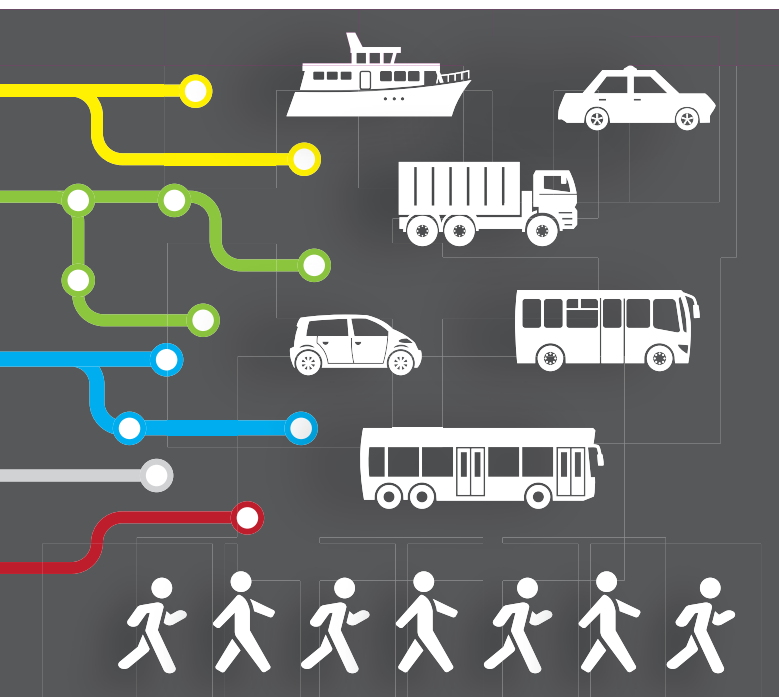
- 3.54| In the longer term, the North Island Line, which will run parallel to the Island Line, is expected to play an important role in improving east-west connectivity and alleviating the loading of the Island Line.

### **Meet transport demand of the expanding CBD**

- 3.55| Subject to the completion of the Central-Wan Chai Bypass and Island Eastern Corridor Link, the Wan Chai Development Phase II, and the Shatin to Central Link projects, the permanent development of the harbourfront areas stretching from Central Piers to Causeway Bay and North Point will gradually take place. The planned enhancement would

bring in new developments to meet the rising demand for office, retail and other commercial uses. At the same time, the potential Phase III development of the Hong Kong Convention and Exhibition Centre is also under consideration. Following the implementation of these initiatives, the new harbourfront areas on the northern shore of Hong Kong Island will be gradually activated and become a key destination for both residents and visitors.

- 3.56| The North Island Line will help support the expansion of the CBD to the new harbourfront of Central and Wan Chai North by providing more convenient railway access to the planned commercial development/redevelopment sites in the area.
- 3.57| The commissioning of the committed railway projects as well as Central-Wan Chai Bypass and Island Eastern Corridor Link may affect the performance of the Island Line and the travel pattern of people. That said, in view of the current pressure on the Island Line, public expectation for a better service level and the desirability of enhancing the robustness of railway access to the CBD, an indicative implementation window from 2021 to 2026 is recommended for planning the North Island Line. The actual implementation of the project is contingent upon the technical and financial studies as well as public consultation at the detailed planning stage, at which juncture we will take into account the latest development proposals and planning parameters, and consider how best to optimise the scheme and maximise development potential in the vicinities.



## Benefits, Implementation and Costs

## 4. BENEFITS, IMPLEMENTATION AND COSTS

### Benefits of the Expanded Railway Network

- 4.1 | Railways are vital to economic growth, social development, environmental protection and people's livelihood. Investment in the railway infrastructure can stimulate the growth of the economy, create opportunities for development and redevelopment, and in effect bring communities closer together.
- 4.2 | In overall terms, the RDS-2014 envisages two main strands of railway development. First, the focus of the majority of the new railway schemes is to support existing or potential key development areas, especially those in the New Territories. In view of continued population growth and the need for steady supply of land to sustain social and economic developments, the Government will work vigorously in optimising the potential development and redevelopment opportunities across the territory, and will continue to leverage on railways to meet the growing transport demand. Second, as far as the urban area is concerned, the new railway schemes will focus on providing additional transport capacity where expansion of road network is constrained, completing missing links in the network, and relieving the possible bottlenecks of specific sections of existing network.
- 4.3 | Generally speaking, the new railway schemes are mostly of a relatively smaller scale, in view of the fact that the railway network (taking existing lines and committed projects together) is already quite comprehensive in

terms of coverage, connectivity and capacity. When all the new projects recommended in this Strategy are completed, the total length of the railways will lengthen from 270 km in 2021 to over 300 km by 2031, and the number of stations in the whole network will increase from 99 in 2021 to 114 by 2031. This level of rail coverage, plus the potential for further extension beyond 2031, will be conducive to the fulfilment of our planning, development, transport and environmental objectives up to 2031 and beyond. The key benefits are further discussed below.

**(a) Integrating land use and transport development**

**4.4 |** Railways can provide better connectivity and additional transport capacity to a potential development area, so that the livability of the area can be enhanced and developments of a higher intensity, which would otherwise overload the road-based transport system, can be materialised. The symbiotic relationship between railway and land development has so far enabled Hong Kong to build a railway network with less public expenditure and higher cost-effectiveness than any other city in the world. The railway schemes in this Strategy further reinforce the notion of integrated land use and transport development in respect of NDAs and housing development projects.

**4.5 |** Taken together, upon the implementation of the railway proposals in this Strategy, the railway network is expected to serve areas inhabited by 75% of the local population and about 85% of job opportunities. With proper integration of the planning for railway and land development, there would



be synergy in broadening the living space for residents in Hong Kong. The expanded network will support the development of NDAs in the New Territories, release the development potential of peripheral areas, and facilitate local rejuvenation, development and economic activities.

**(b) Serving Hong Kong's transport demand**

- 4.6 | The expanded railway network will cover more areas and provide railway service to more people. It will improve the connectivity and accessibility of NDAs, relieve the pressure on critical transport corridors, as well as boost operational robustness and reliability. With the implementation of the railway projects, the rail share in the public transport patronage will further rise to between 45% and 50% in 2031 depending on a myriad of variables including transport policy, population and employment growth, as well as changes in economic conditions.
- 4.7 | The expanded railway network will help shorten journey time and make travel easier across the territory. Other than that, the alleviation of train crowdedness and the availability of more route choices are valued by passengers. We expect that the railway network, upon expansion, will be more responsive to transport needs, more reliable in fulfilling passengers' expectation, and more robust in coping with unforeseen circumstances.
- 4.8 | The railway schemes proposed in this Strategy will provide adequate capacity and travel conditions to meet the forecast transport demand in 2031 such that most of the railway lines will operate below their maximum

capacity at peak hours, allowing for further passenger growth. Typical journey times for some selected routes in 2031 are as follows:

- Tin Shui Wai to Sheung Shui                      35 minutes
- Sau Mau Ping to Tsim Sha Tsui                35 minutes
- Tseung Kwan O to Tamar                        22 minutes
- Wah Fu to Wan Chai                                25 minutes

### (c) Environmental benefits

4.9 | Railways can save land, minimise the reliance on road travel and reduce the use of energy. It will also help curb roadside pollutant emissions. With the implementation of the railway proposals, the rail share in the public transport patronage would rise to some 45% to 50% of the total number of trips by 2031, and a reduction in road-based transport is expected. On the assumption that the switch from road-based transport to the railway is proportional to the decrease in the total distance travelled by vehicles, this would translate into environmental benefits amounting to a reduction in roadside air pollutants by some 190 tonnes of nitrogen oxide per year, and 143 000 tonnes of green house gases per year, i.e. reduction of about 2% to 4% of the roadside air pollutants and green house gases per year. At the same time, the relief to road congestion can benefit the overall productivity and competitiveness of Hong Kong.

4.10| The Strategic Environmental Assessment conducted as part of the Review and Update of the “Railway Development Strategy 2000” concludes that none of the new railway schemes will present insurmountable environmental problems when some indicative corridors and alignments

are used for strategic evaluation purpose. Potential environmental impact of individual railway schemes will be addressed during their respective design and development process.

**(d) Economic return**

4.11| In line with common international practice for infrastructure projects and established methodology, the economic return assessment is an indicator of the benefits that the expanded railway network will bring to the community. Conventionally, economic return is represented by the economic internal rate of return. The economic internal rate of return of a transport infrastructure project mainly reflects the savings in the travelling time of public transport users over the project life (of 50 years), as a measure of the overall cost-effectiveness of the project to the community. Taken as a whole and on the basis of the 2009-based TPEDM (please refer to note 2 of **Table 1**), the investment in the expanded railway network will bring direct economic benefits (mainly in terms of savings in travelling time) to Hong Kong of \$3 – 4 billion per annum by 2031 upon the operation of all the projects. The overall economic internal rate of return is estimated at about 2%. This estimated return reflects the fact that the existing and committed railway network has already covered the major population nodes. Any further improvement to the railway network is not expected to yield as high an economic internal rate of return (as conventionally defined) as that of previous railway schemes which served large development areas lacking railway connection.

- 4.12] However, the railway expansion proposal will bring a range of other economic benefits, even though these may be less readily quantifiable. For a more comprehensive evaluation, railway schemes should be viewed in terms of the important, strategic benefits such as the following:
- **to support land use proposals and development opportunities** (as explained in (a) above);
  - **to offer transport service of higher quality** (as explained in (b) above);
  - **to cultivate a greener environment** (as explained in (c) above); and
  - **to create job opportunities** – The proposal is expected to generate job opportunities in a variety of trades (e.g. construction, railway operation and maintenance, station retail, logistics, related supply chain, other commercial activities in the vicinity, etc.).
- 4.13] All these factors should be taken in totality in the overall appraisal of the railway proposals as they are all concerned with the sustainability of a community, such as the quality of life, mobility of the population, and competitiveness of the economy.

## Implementation

- 4.14] In setting the priority and indicative timing for the implementation of the recommended railway schemes for planning purpose, we have had regard to the following considerations -
- (a) plans for land use development and local housing demand;

- (b) transport needs in Hong Kong: high level of connectivity, relief to the loading of critical transport corridors, and operational robustness of the railway network;
- (c) economic return and other benefits; and
- (d) views of the public and local communities.

4.15| As pointed out in paragraph 1.3 above, the taking forward of the recommended projects will be subject to the outcome of detailed engineering, environmental and financial studies relating to each project, as well as updated demand assessment and availability of resources. As projects other than railways such as initiatives on land production and housing supply as well as hospitals and strategic roads may be equally, if not sometimes more, important to the community, the Government will carefully consider all relevant factors and strike a reasonable balance among various interests of the community when mapping out the way forward for each railway project. In particular, we will critically examine the financial implications of each individual project to the Government and consider the most appropriate implementation programme and financing arrangements for each project. In addition, for railway projects which are contingent upon the progress of residential developments, the timetable for the implementation of the railway schemes may be adjusted. Prior to the finalisation of any new railway schemes, there will be further public consultation.

4.16| The projects to which we have accorded priority are summarised below -

Package	Remarks
Northern Link and Kwu Tung Station	<p>The Northern Link will enhance east-west connectivity, serve the Kwu Tung North NDA in the New Territories, improve network robustness and facilitate cross-boundary movements. We will reserve land and make design provisions for intermediate stations along its alignment to serve the potential developments in Au Tau, Ngau Tam Mei and San Tin, as well as bifurcation between the Kam Sheung Road Station and the Lok Ma Chau Station. We will also make provisions for extending the Northern Link to serve the potential developments in future (such as Fanling North, Ping Che/Ta Kwu Ling/Hung Lung Hang) taking into account the latest planning proposals on the New Territories North development which are under study.</p> <p>Indicative implementation window for planning purpose: 2018 to 2023</p>

Package	Remarks
Tuen Mun South Extension	<p>The Tuen Mun South Extension will enhance the connectivity of the Tuen Mun South area and promote the use of the railway as the main mode of travel.</p> <p>Indicative implementation window for planning purpose: 2019 to 2022</p>
East Kowloon Line	<p>The East Kowloon Line will provide additional transport capacity to serve the planned developments in the north Kwun Tong area and improve operational robustness of the railway network. There is a need to overcome technical challenges arising from the hilly environment at the detailed planning stage.</p> <p>Indicative implementation window for planning purpose: 2019 to 2025</p>
Tung Chung West Extension	<p>The line extension will support and tie in with the extension of the Tung Chung New Town. Subject to the development direction of the Tung Chung New Town and further feasibility study, a Tung Chung East Station, which does not form part of this Strategy, may be added in due course.</p> <p>Indicative implementation window for planning purpose: 2020 to 2024</p>

Package	Remarks
Hung Shui Kiu Station	<p>The station will support and tie in with the development of the Hung Shui Kiu NDA.</p> <p>Indicative Implementation window for planning purpose: 2021 to 2024</p>
South Island Line (West)	<p>The South Island Line (West) will provide additional transport capacity to the western part of Hong Kong Island, serve any increase in public transport demand resulting from potential developments and improve network robustness.</p> <p>Indicative implementation window for planning purpose: 2021 to 2026</p>
North Island Line	<p>The North Island Line will help divert the harbour-crossing passenger traffic, relieve the loading of the Island Line and enhance railway access to the northern shore of Hong Kong Island.</p> <p>Indicative implementation window for planning purpose: 2021 to 2026</p>

**Note:** The term “**Indicative implementation window**” refers to the period within which construction is likely to take place and reach completion.



4.17| The implementation of individual railway projects encompasses a chain of activities before construction starts. These include preparation of a project proposal covering the detailed technical and financial estimates, scrutiny of the project proposal within the Government, consultation with the public and stakeholders and resolution of the comments received, pre-feasibility study, site investigation, project design and further public consultation, gazettal of railway scheme and handling of objections, Environmental Impact Assessment, seeking authorisation of railway schemes, as well as preparation and signing of related agreements with the company responsible for the construction. In the process, the Government needs to seek the Executive Council's authorisation for the design and construction of the project and the Legislative Council's approval for the funding concerned. When the project proceeds to the construction stage, there may be a need for land resumption and liaison with local stakeholders to settle claims. Furthermore, despite the pre-construction planning and preparations, we will still face the issue of the capacity of the construction industry and unforeseen engineering challenges. (For example, given the limited climbing capability of railways, some sections of the East Kowloon Line to be built along the hillside need to go deep underground. The consultant expects that the works will be technically very challenging, but the actual difficulties can only be verified or discovered upon site investigation and formulation of the railway design, or even as late as during the construction. At this stage, our assessment of the implementation windows of the new railway projects is based on the experience of implementing railway projects and the typical procedures involved.) All these may eventually take longer time than intended. Thus,

the indicative implementation windows of the railway projects stated in this Strategy are subject to adjustment as individual projects advance.

- 4.18| In the planning for the new railway lines, a service benchmark of four persons per square metre in train compartments will be adopted. As for the extension of existing railway lines, the service level will be subject to the infrastructural constraints of the existing lines to which they are added, such as the signalling system and shortest platform of a line.
- 4.19| Although this Strategy has mapped out the railway development plan up to 2031, we are mindful of the need to look beyond this time frame to keep pace with the ongoing development of Hong Kong, and to take account of the changing circumstances. We will continue to monitor the progress of various development projects, and will give consideration to new transport infrastructure or improvement works for the existing transport infrastructure as and when appropriate.

### **Coordination with Other Public Transport Modes ("Public Transport Hierarchy")**

- 4.20| While railway is the backbone of Hong Kong's public transport network, other public transport modes such as franchised buses, public light buses and taxis will continue to play complementary, yet strategic, roles in our transport planning. The various transport modes together provide the travelling public with comprehensive services and alternatives. Specifically, franchised buses play an important role in our passenger transport system, especially in areas not easily accessible to the railway network. In tandem

with the further development of our railway system, the Government will continue to optimise road-based transport services. For example, we will pursue bus route rationalisation with vigour to ensure the overall efficiency of our public transport network in keeping with the changing pattern of passenger demands.

## Order of Costs

- 4.21| The preliminary cost estimate of all the seven recommended railway schemes is in the order of \$110 billion (in 2013 prices). **Table 2** shows the preliminary cost estimates for the individual railway proposals. The figures are only indicative and will need to be revised based on in-depth studies to be carried out at the detailed planning stage for the individual railway schemes.

**Table 2: Preliminary cost estimates of individual projects**

Railway project	Preliminary cost estimate (\$ billion, in 2013 prices)
Northern Link and Kwu Tung Station	23
Tuen Mun South Extension	5.5
East Kowloon Line	27.5
Tung Chung West Extension	6
Hung Shui Kiu Station	3
South Island Line (West)	25
North Island Line	20
<b>Total</b>	<b>110</b>



## Assessment of Other Railway Proposals



## 5. ASSESSMENT OF OTHER RAILWAY PROPOSALS

5.1 | Among the ten railway proposals that the Government put forward for consultation, in the two stages of PE exercise, three are not included in this Strategy. Given the uncertainty regarding these schemes, it would be premature to set implementation targets within the time frame of the Strategy. Based on the consultant's data and analyses, our assessments of these schemes are briefly set out below.

### (a) Hong Kong – Shenzhen Western Express Line

5.2 | The conceptual proposal for the Hong Kong – Shenzhen Western Express Line (WEL) comprises three components: (i) a main line between the Hong Kong International Airport and the Shenzhen Bao'an International Airport; (ii) a cross-boundary spur line between the western part of Shenzhen (Qianhai) and the northwestern New Territories (Hung Shui Kiu); and (iii) a domestic spur line connecting the northwestern New Territories (Tuen Mun South) and northern Lantau (Siu Ho Wan) (see **Figure 12**).

5.3 | During the PE exercise, there were mixed views on the WEL. While some respondents agreed that it could facilitate economic development by connecting the two airports, many others cast doubt about its patronage, market demand and financial viability.

5.4 | Given the complicated technical constraints involved in constructing an under-sea railway tunnel, the cost of the WEL (Hong Kong section) is expected to well exceed \$110 billion (in 2013 prices). Even with the complementary spur lines (the cross-boundary spur line and the domestic spur line), the consultant's assessment on the WEL in its proposed form shows that its economic benefits have yet to be proven, whereas the cost-effectiveness and the market demand of the line are dependent on external factors, such as the passenger demand for inter-airport transit services<sup>6</sup> and the economic benefits so generated, as well as the likely cross-boundary transport demand between Qianhai and Hong Kong, which depends largely on the pace and breadth of Qianhai's development and its impact on Hong Kong. Besides, upon the implementation of new infrastructure projects, such as the Tuen Mun to Chek Lap Kok Link targeted for completion in 2018, compounding with the Hong Kong-Shenzhen Western Corridor and the Guangshen Yanjiang Expressway, the north-south connection in the New Territories and the cross-boundary transport provisions will be significantly improved.

5.5 | With due regard to the latest information available at the time of the consultancy study, the overall financial viability of the WEL is in doubt, thus we have not included the proposal in this Strategy. This notwithstanding, we are aware of the potential opportunities that may arise from the substantial development envisaged in the Qianhai area. Closely monitoring the situation of Qianhai development, and any significant increase in cross-

<sup>6</sup> Inter-airport transit services refer to services to facilitate passengers to travel from one airport to another one. For example, availability of coaches for passengers to travel between airports; and that passengers can check in and obtain boarding passes for connecting flights at either airport, etc.

boundary transport demand and changes in development parameters in future, we will separately explore the feasibility, as well as economic and social benefits of building a cross-boundary express rail link (or other transport infrastructure) connecting Hong Kong and Qianhai to allow Hong Kong to grasp the development potential of Qianhai with a view to achieving mutual benefits. Any study in this respect will be undertaken outside the context of the RDS-2014.



**Figure 12: Preliminary Conceptual Scheme of the Hong Kong – Shenzhen Western Express Line**

**(b) The Coastal Railway Between Tuen Mun and Tsuen Wan (Tuen Mun to Tsuen Wan Link)**

**5.6 |** The proposed Tuen Mun to Tsuen Wan Link (see **Figure 13**) envisages a railway station in Tuen Mun West and five intermediate stations along the 20 km coastal corridor.

**5.7 |** We have carefully examined the catchment area which the proposed scheme is intended to serve. The local population is mainly concentrated at the eastern and western ends of the 20 km coastline between Tuen Mun and Tsuen Wan, while the remaining population is scattered and dispersed along the coast. For passengers wishing to travel from Tuen Mun to Tsuen Wan (or vice versa), using the Tuen Mun to Tsuen Wan Link instead of the West Rail Line would only generate very limited travel time savings of around one minute. In either case, interchange to other railway lines would be required in the Tsuen Wan area for onward train journeys. For passengers boarding further north of Tuen Mun, e.g. at the Siu Hong Station, taking the Tuen Mun to Tsuen Wan Link would mean a longer overall journey time with two additional interchanges. We will keep a close watch on the usage of the West Rail Line, and evaluate the cumulative effects of the various NDAs and the Northern Link on the West Rail Line, so as to explore other transport infrastructure and measures in good time to provide relief to the railway line.

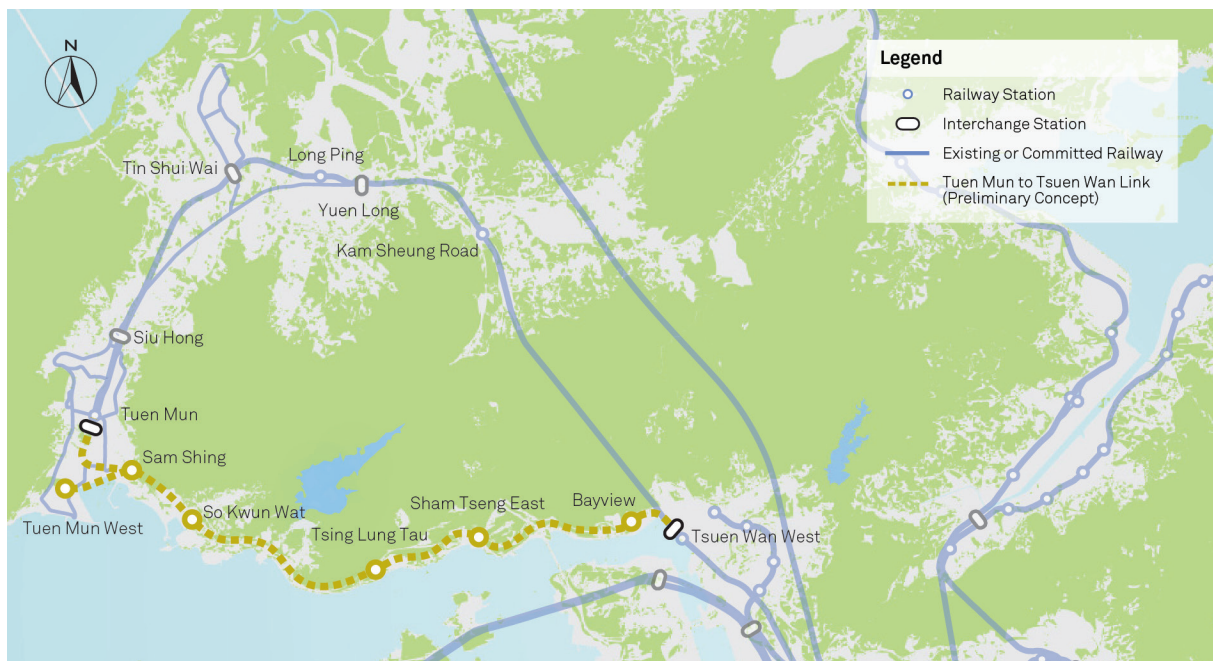
**5.8 |** With reference to the latest planning condition, the residential population within the coastline areas between Tuen Mun and Tsuen Wan is expected



to grow by about 11% by 2021, with no significant growth beyond. The distribution pattern will remain largely identical by 2031.

**5.9 |** After the improvement works for Tuen Mun Road are completed in 2014, road traffic between Tuen Mun and the urban area will be further improved. The journey time for the bus services currently serving routes between Tuen Mun and the urban area will likely be shortened. As a result, more passengers may prefer to travel to and from Tuen Mun by bus, leading to relatively lower attractiveness of the railway scheme insofar as time savings are concerned. Moreover, implementation of the project will also create negative visual and landscape impacts along the scenic coastal areas. The cost of the project is also expected to be very high (in the region of \$65 billion (in 2013 prices)) due to the technical difficulties involved. The cost-effectiveness can hardly be established up to this point.

**5.10|** Based on the latest development planning and population distribution, the potential for further development by either reclamation or site formation at hillsides along the coast between Tuen Mun and Tsuen Wan is not substantial. We would consider revisiting the railway proposal if there are further changes in the planning circumstances and population as well as increase in transport demand in the longer term in the coastal areas between Tuen Mun and Tsuen Wan or other relevant new considerations in the planning for development in the region.



**Figure 13: Preliminary Conceptual Scheme of the Tuen Mun to Tsuen Wan Link**

**(c) Siu Sai Wan Line**

**5.11|** Three options for a Siu Sai Wan Line were explored in our consultancy study and PE exercise, namely the “Extension”, the “Bifurcation” and the “Feeder” Schemes, each with different merits and shortcomings.

**5.12|** The “Extension” Scheme is a direct extension of the Island Line from the existing Chai Wan Station to Siu Sai Wan. The “Bifurcation” Scheme is to build a spur line bifurcating from the existing Heng Fa Chuen Station, such that east-bound trains will terminate alternately at the Chai Wan Station and a new station in Siu Sai Wan. The “Feeder” Scheme features a dedicated medium capacity railway system that connects Siu Sai Wan to the Heng Fa Chuen Station, with the need for interchange between this feeder and the Island Line.

- 5.13| There was substantial local support in the Eastern District for the provision of railway service to Siu Sai Wan. As regards the cost-effectiveness of the Siu Sai Wan Line, some academics, professionals and members of the public had reservation since the population of Siu Sai Wan would not be sufficient to support the railway extension, and the existing feeder services were convenient to local residents. Some professionals suggested that the Siu Sai Wan Line should be developed only when there were plans on further developments in Siu Sai Wan.
- 5.14| As the existing road-based feeder services, such as franchised buses and public light buses, are convenient, flexible and able to connect Siu Sai Wan to the existing railway stations, the “Feeder” Scheme may not be competitive due to its limited catchment in Siu Sai Wan and the need to interchange with the Island Line. Under the “Bifurcation” Scheme, the trains have to stop alternately at Chai Wan and Siu Sai Wan, meaning that the service frequency of the existing railway service to Chai Wan would become lower and the operation of the Island Line would be affected. Among the three options consulted on, there was general consensus that the best option to serve the Siu Sai Wan residents would be to extend the Island Line as it would be the most convenient (see **Figure 14**). However, the Chai Wan end of the Island Line is currently surrounded by a number of buildings (such as residential buildings and malls) which block the extension of that line. The possibility of the “Extension” Scheme may therefore be further considered only when the constraint is removed through redevelopment of the buildings concerned. In the event of re-consideration of this project, it is still necessary to examine the economic and financial benefits at the material time.



**Figure 14: Preliminary Conceptual Scheme of the Siu Sai Wan Line**

**(d) Other suggestions**

**5.15|** Apart from the ten railway proposals, we also received other railway development suggestions from the public during the PE exercise. Subsequently, the consultant carried out a careful assessment to optimise the overall planning for the railway development. Among these, the suggestion of providing connection to the East Kowloon area, upon the consultant’s review, has been incorporated in the aforementioned East Kowloon Line proposal (paragraph 3.32)

5.16| Of the various other proposals, some had been reviewed by the consultant at an earlier stage of this study but found not worthy of further consideration. Some were considered technically infeasible due to existing buildings and infrastructure, geological conditions and other environmental constraints along the proposed alignments. Some others were found operationally infeasible in view of the complications of interfacing with the existing railway lines and spatial problems in the provisioning of railway depots and stations. There were also suggestions on railway connection to areas with no planned developments and a relatively low transport demand. These do not command priority at this stage, and may be revisited if planning parameters or physical conditions change significantly over time.