



**Highways Department**

**Smart and Green Mass Transit System  
in East Kowloon**

**Project Profile**

## CONTENTS

1	BASIC INFORMATION.....	1
1.1	Project Title .....	1
1.2	Purpose and Nature of the Project.....	1
1.3	Name of Project Proponent .....	1
1.4	Location and Scale of the Project and the History of Site .....	2
1.5	Number and Types of Designated Projects to be covered by the Project Profile.....	2
1.6	Contact Person.....	3
2	OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME.....	4
2.1	Project Planning and Implementation .....	4
2.2	Project Programme .....	4
2.3	Interactions with other Projects.....	4
3	POSSIBLE IMPACT ON THE ENVIRONMENT .....	5
3.1	General .....	5
3.1.1	Air Quality.....	5
3.1.2	Noise.....	5
3.1.3	Water Quality .....	6
3.1.4	Ecology.....	6
3.1.5	Landscape and Visual.....	7
3.1.6	Cultural Heritage .....	7
3.1.7	Waste Management .....	8
3.1.8	Land Contamination.....	8
3.1.9	Hazard to Life.....	8
3.1.10	Landfill Gas Hazard .....	9
4	MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT .....	10
4.1	Existing and Planned Sensitive Receivers .....	10
5	ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS.....	13
5.1	General .....	13
5.2	Measures to Minimize Environmental Impacts .....	13
5.2.1	Air Quality.....	13
5.2.2	Noise.....	14
5.2.3	Water Quality .....	15
5.2.4	Ecology.....	16
5.2.5	Landscape and Visual .....	17
5.2.6	Cultural Heritage .....	17
5.2.7	Waste Management .....	18
5.2.8	Land Contamination.....	18
5.2.9	Hazard to Life.....	19
5.2.10	Landfill Gas Hazard .....	19
5.3	Severity, Distribution and Duration of Environmental Effects and Further Implications.....	20
6	USE OF PREVIOUSLY APPROVED EIA REPORTS .....	21

### TABLE

Table 4.1	Major Sensitive Receivers/Concerned Areas/Hazard Installation in the Vicinity of the Project
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### FIGURE

Figure 1	Smart and Green Mass Transit System in East Kowloon Preliminary Scheme
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## **1 BASIC INFORMATION**

### **1.1 Project Title**

Smart and Green Mass Transit System in East Kowloon (hereafter referred to as “the Project”)

### **1.2 Purpose and Nature of the Project**

The northern areas of Kwun Tong are densely populated. With the gradual population intake of the housing developments in the areas, the transport demand in the northern uphill areas of Kwun Tong will continue to increase. At present, residents in Kwun Tong uphill areas who wish to take the railway need to use the road-based transport feeder services to gain access to the nearby railway stations. To address the commuting needs of residents in the northern uphill areas of Kwun Tong, it is considered necessary to provide a feeder transit system to connect the Kwun Tong uphill areas to the existing railway network.

The Chief Executive’s 2023 Policy Address announced to implement a Smart and Green Mass Transit System in East Kowloon (EKGTS) with an aim to improving the overall transportation of East Kowloon and unleashing development potential. The Project has also been incorporated in the "Hong Kong Major Transport Infrastructure Development Blueprint" published by the Transport and Logistics Bureau in December 2023.

With a length of about 7 km, the proposed EKGTS would connect the uphill areas of Kwun Tong, including Choi Wan, Shun Lee, Shun On, Sau Mau Ping, Po Tat and Ma Yau Tong, and would pass through New Clear Water Bay Road, Lee On Road, Shun On Road, Sau Mau Ping Road, Po Lam Road, Lei Yue Mun Road, etc. The implementation of the EKGTS would provide light and green transport feeder services in the northern uphill areas of Kwun Tong to the nearby railway stations and major public transport interchanges, facilitating access to MTR Choi Hung Station and Yau Tong Station, thus providing convenient access and more commuting options for the public. In addition, the provision of pedestrian linkage facilities to Anderson Road area would be studied with a view to providing convenient connections in response to the commuting needs of the residents of On Tai Estate and On Tat Estate.

The proposed EKGTS is a light and green transit system of medium to low carrying capacity, which will adopt environmentally friendly and smart technologies and operate on a dedicated corridor to improve the transport efficiency, safety and convenience. On the other hand, the dedicated elevated corridor will be separated from road traffic along the alignment which would not be affected by traffic conditions.

### **1.3 Name of Project Proponent**

Highways Department of the Government of Hong Kong Special Administrative Region (HKSAR).

## 1.4 Location and Scale of the Project and the History of Site

The proposed EKGTS alignment is approximately 7 km long and runs between Choi Hung East and Yau Tong East across the upper East Kowloon area.

The alignment connects the major population areas along the upper East Kowloon area. These areas include Choi Hung, Choi Wan, Shun Tin, Sau Mau Ping, Po Tat, and Yau Tong. The viaduct section from Choi Hung East (CHE) to Ma Yau Tong (MYT) runs elevated. From MYT, the viaduct passes over the Tseung Kwan O (TKO) Tunnel approach before entering a portal to run in tunnel under Black Hill. Upon exiting a portal, the alignment runs elevated to the Yau Tong East (YTE) terminus on Lei Yue Mun Road. A depot is proposed to be located at MYT where there is a service connection to the existing road network at Po Lam Road. The indicative preliminary alignment is shown in *Figure 1*.

Subject to the findings of the investigation study and design, the scope of the Project mainly comprises the following:

- (i) construction of the Smart and Green Mass Transit System of about 7 km long (including viaducts of about 6 km long, tunnel of about 1 km long and 8 stations) from Choi Hung East near the existing MTR Choi Hung Station via Choi Wan, Shun Lee, Shun On, Sau Mau Ping, Po Tat and Ma Yau Tong to Yau Tong East near the existing MTR Yau Tong Station;
- (ii) construction of the depot and system-wide facilities, such as signalling system, operation control and monitoring facilities, charging facilities, passenger facilities and fare collection system, etc.;
- (iii) construction of pedestrian linkage facilities connecting the stations and On Tai Estate, On Tat Estate and area in the vicinity of Anderson Road; and
- (iv) associated civil, geotechnical, landscaping, road and drainage works, ancillary buildings, electrical and mechanical installations, re-provisioning of facilities affected by the proposed works and environmental mitigation measures.

## 1.5 Number and Types of Designated Projects to be covered by the Project Profile

The Project is a designated project by virtue of Item A.2 “A railway and its associated stations”, Item A.4 “A railway siding, depot, maintenance workshop, marshalling yard or goods yard” or Item A.6 “A transport depot located less than 100m from the nearest boundary of an existing or planned (a) residential area”, and Item A.7 “A road or railway tunnel more than 800 m in length between portals” under Part I, Schedule 2 to the Environmental Impact Assessment Ordinance (EIAO) (Cap. 499). An environmental permit is required under the EIAO for the construction and operation of the Project.

## **1.6 Contact Person**

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## **2 OUTLINE OF PLANNING AND IMPLEMENTATION PROGRAMME**

### **2.1 Project Planning and Implementation**

The Project Proponent will engage consultants to undertake the investigation study and design of the Project. The construction works will be carried out by the qualified contractor. Detailed implementation arrangement of the Project is subject to the findings of the investigation study and design.

### **2.2 Project Programme**

The investigation study is targeted to be commenced in mid-2024 and the Project is targeted to commence construction in 2027. This provisional implementation programme is subject to review.

### **2.3 Interactions with other Projects**

Major committed / planned projects that will potentially interface with the EKGTS have been identified and are listed below. Any cumulative impact from the concurrent projects during both construction and operational phases of the Project will be addressed in the Environmental Impact Assessment (EIA) as appropriate. The list below should be re-visited during the EIA Study stage to ensure all of the latest projects available from the respective stakeholders are incorporated.

- Development of Anderson Road Quarry site;
- Public Housing Developments at Pik Wan Road, Yau Tong;
- Relocation of Yau Tong Group Fresh Water and Salt Water Service Reservoirs to Caverns;
- Proposed Redevelopment of Choi Hung Estate;
- Proposed Tseung Kwan O – Yau Tong Tunnel; and
- Other major developments along EKGTS.

### **3 POSSIBLE IMPACT ON THE ENVIRONMENT**

#### **3.1 General**

During the construction phase, the construction works mainly include site formation, foundation and pier works, viaduct structure, elevated station structure and tunnelling works with drill and blast method. During the operation phase, the Project would involve the operation of an electrically powered transit system on a dedicated corridor along the EKGTS alignment and that of the associated stations and depot.

The potential environmental impacts associated with the Project during both construction and operation phases are discussed in the following paragraphs. Detailed impact assessments will be carried out during the EIA Study.

##### **3.1.1 Air Quality**

###### Construction Phase

The potential major source of air quality impact to the air sensitive receivers (ASRs) during the construction phase of the Project would be the dust emissions generated from various construction activities, including excavation of materials, handling and stockpiling of material, movement of construction traffic, and potential wind erosion for temporary stockpile of loose materials at the works sites/areas. During tunnel excavation by drill and blast operations, fresh air would need to be provided for the tunnel, and fumes and stale air might have to be extracted via the tunnel portals. Cumulative impacts from other potential interfacing projects planned in the vicinity of the Project would be identified and taken into account in the EIA Study.

###### Operational Phase

The proposed EKGTS is operated by electrically-powered vehicles, and no dust and gaseous emissions will arise from the operation. As such no air quality issues are envisaged. In depot, gaseous and particulate emissions generated from exhaust emissions of equipment used for maintenance operations are expected to be insignificant as the equipment is operated on a routine but infrequent basis.

##### **3.1.2 Noise**

###### Construction Phase

During the construction phase, the use of powered mechanical equipment (PME) for the construction works of the Project would likely cause potential noise impact on the existing and planned Noise Sensitive Receivers (NSRs) located in the vicinity of the works sites/areas. Major construction activities include:

- Site formation, general earthworks and spoil removal;
- Piling and foundation works;
- Viaduct, station and depot construction;
- Tunnel construction with drill & blast method; and
- Concreting and general construction activities

In the EIA Study, a construction noise impact assessment with the project implementation details and proposed noise mitigation measures will be submitted for qualitatively demonstrating that no adverse construction noise impact would be associated with the Project.

#### Operational Phase – Transit System Noise

The key noise impact will be from the operation of the transit system on viaduct sections and above-ground stations, including that generated from the air conditioning systems and interaction between the wheels/tyres of the transit vehicle and the track or rail, as well as from the running motor. Unlike conventional public road transport, which runs on diesel-power with engines, the transit system is electrically powered, which is expected that the operational noise generated from the EKGTS will be lower than the traffic noise such as buses. The assessment methodology will be agreed with the Director of Environmental Protection prior to the commencement of assessment.

#### Operational Phase – Fixed Plant Noise from Stations, Ventilation Buildings and Depot

There would be other fixed plant noise sources (i.e. electrical and mechanical equipment) to be provided at EKGTS stations, ventilation buildings and depot. It is expected that most of the fixed noise sources would be housed within plant rooms, which would be effective in most cases for minimising noise impacts. The fixed plant/noise source at the ventilation buildings near tunnel portal and depot should be located away from the NSRs as far as practicable.

### **3.1.3 Water Quality**

#### Construction Phase

The potential sources of water quality impact would be related to construction activities near and across Water Sensitive Receivers (WSRs). Construction site runoff and drainage; construction wastewater, debris, refuse and liquid spillages; and sewage from the on-site construction workforce would be potential sources of water quality impacts.

#### Operational Phase

Potential water quality impacts during the operational phase would mainly be related to sewage effluents from the staff and passengers and trade effluents from shops at the stations, surface run-off from viaduct and station areas, and maintenance works in the depot.

### **3.1.4 Ecology**

#### Construction Phase

The preliminary alignment of EKGTS would not fall within existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted proposed marine park or marine reserve, a site of cultural heritage, or a site of special scientific interest. However, the potential direct impact from the proposed works for depot construction at MYT will result in habitat loss of woodland, natural/semi-natural watercourse, and plantation habitats. The proposed tunnelling works would generate



indirect impacts (e.g. dust, noise, vibration, site run-off) and may affect the habitats aboveground and its associated fauna at the Black Hill. Moreover, potential drawdown of underground water table and / or hydrological change of aboveground streams may be resulted.

#### Operational Phase

It is anticipated that the potential impacts to habitat types along the preliminary alignment will be less severe than those identified for the construction phase and will be assessed in detail during the EIA Study stage. The anticipated ecological impacts include direct loss of habitat, disturbance to wildlife and vegetation due to the proposed depot development at MYT.

### **3.1.5 Landscape and Visual**

#### Construction Phase

Landscape impacts may arise during the construction of the Project as a result of the removal of existing trees and vegetation, the use of construction equipment, the erection of hoardings and temporary structures, erection of station and other structures, cut and cover works and lighting for the construction sites. There will be potential impacts arising from the construction works at MYT Depot and provision of pedestrian connection facilities at other location in vicinity of EKGTS's stations. The degree of impact will be subject to further study in the EIA Study stage.

#### Operational Phase

The sources of landscape and visual impact from the Project are the associated infrastructures, which are preliminarily identified and listed below:

- Station structures;
- Associated lift towers and footbridges;
- Viaducts;
- Noise barriers and noise enclosures mounted on the viaduct;
- Single columns and portal structures;
- Tunnel portal structures and associated geotechnical/building works;
- Elevated walkways connecting to existing pedestrian network;
- Turn-around facility;
- Refuge siding; and
- Depot structures.

There may be potential change of visual quality to the adjacent visual sensitive receivers due to the Project. The degree of changes will be subject to further study with the findings to be captured in the EIA Study.

### **3.1.6 Cultural Heritage**

#### Construction Phase

Two graded historic buildings, namely St. Joseph's Home for the Aged (Grade 2) and Man Fat Nunnery (Grade 3) are located with a separation distance of approximately 60m and 300m from CHE respectively. Although direct cultural heritage impact on these

graded historic buildings would not be anticipated due to sufficient set back distance, potential indirect impacts of construction activity such as foundation works is anticipated. In addition, there are several places of worship in the vicinity of the EKGTS alignment, including Shun Lee Estate Shun Tak Temple, Shun Tin Shrine and Temple of Guan Yin (Po Lam Road). A comprehensive review of the cultural heritage resources will be included in the EIA Study.

There is no Site of Archaeological Interest (SAI) identified within and around 100m of the EKGTS alignment. Therefore, it is anticipated that no direct or indirect impact on SAI during the construction phases. The archaeological potential of the assessment area will be reviewed and established, if any, in the EIA Study.

#### Operational Phase

No potential operational impacts are anticipated, subject to further review and findings under the EIA Study.

### **3.1.7 Waste Management**

#### Construction Phase

Wastes generated from the construction of the Project would include construction and demolition (C&D) materials, general refuse from the onsite workforce, and some chemical wastes from the maintenance of construction plant and equipment. These wastes may have the potential to give rise to environmental impacts if not properly handled and disposed of. C&D materials will be generated from excavation, foundation, and superstructure works. Spoil would mainly be generated during the foundation and tunnelling works.

#### Operational Phase

The key issue concerning waste is anticipated to be mainly related to the management of general refuse and small amounts of chemical waste generated from the operation of the stations and depot. No adverse impacts from operational wastes are expected with the implementation of proper waste management and waste recycling practices.

### **3.1.8 Land Contamination**

No land use associated with potential contamination is observed along the preliminary alignment of EKGTS. Hence, land contamination is not anticipated at the area mentioned in Section 1.4. Site reappraisal is recommended in the EIA Study stage if there is any land use change associated with potential land contamination activities in the future.

### **3.1.9 Hazard to Life**

#### Construction Phase

With reference to the latest Potentially Hazardous Installation (PHI) register, no PHI is identified in the vicinity of the preliminary alignment of EKGTS.

For the construction of the tunnel section, drill and blast technique may be utilized in excavation in rock. Use of explosives may pose potential risk impacts to nearby populations, Ma Yau Tong Central Landfill, TKO Tunnel and Tseung Kwan O – Lam Tin Tunnel. A risk assessment will be conducted to assess the hazards due to the storage, transport and use of explosives.

Operational Phase

No significant impacts are anticipated to be generated by transit system operation. However, any potential hazardous impacts will be reviewed in the EIA Study stage.

### **3.1.10 Landfill Gas Hazard**

Construction Phase

Part of the alignment of the EKGTS will be located in the 250m consultation zones of the nearby closed landfills, including Ngau Chi Wan Landfill, Jordan Valley Landfill and Ma Yau Tong Central Landfill. It is expected that there will be excavation, drilling, blasting, piling, utility installation, drainage, and superstructure works within these consultation zones during the construction phase.

Operational Phase

Since the EKGTS will be partially located within the 250m consultation zones of the closed landfills, the risk to operational staff and passengers should be further reviewed. Therefore, any precautionary measures, as well as the requirement of maintenance and monitoring, should be prepared by a competent person and submitted to EPD for approval during the later stage of the Project.

## 4 MAJOR ELEMENTS OF THE SURROUNDING ENVIRONMENT

### 4.1 Existing and Planned Sensitive Receivers

The smart and green mass transit system proposed under the Project is located in the upper East Kowloon area with a route length of about 7 km long between Choi Hung East to Yau Tong East. The alignment of viaduct section would pass through a well-developed area and run in tunnel section under Black Hill.

The major sensitive receivers and sensitive parts of the natural environment and potential hazard installation, which might be affected by the Project, are listed in **Table 4.1**. The list is not exhaustive and will be reviewed during the EIA Study.

**Table 4.1 Major Sensitive Receivers/Concerned Areas/Hazard Installation in the Vicinity of the Project**

Types	Sensitive Receivers/Concerned Areas/Hazard Installation
Existing Residential Areas (including associated facilities)	Ping Shek Estate 8 Clear Water Bay Road Choi Hung Estate Choi Wan Estate Choi Fai Estate Choi Hing Court Shun Lee Disciplined Services Quarters Shun Lee Estate Shun Chi Court Shun On Estate Shun Tin Estate Sau Mau Ping Estate On Tai Estate On Tat Estate Po Tat Estate Village Houses at Ma Yau Tong Hong Nga Court Kwong Tin Estate Hong Pak Court Yau Lai Estate Yau Tong Estate Yau Chui Court Yau Mei Court Ko Cheung Court Ko Yee Estate
Planned and under Planning Residential Developments and G/IC	Ngau Chi Wan Comprehensive Development Area Ngau Chi Wan Village Public Housing Development Development of Anderson Road Quarry site Housing Development at Ko Chiu Road (Yau Tong Ventilation Building)

	Public Housing Developments at Pik Wan Road Yau Tong Bay Comprehensive Development Area Redevelopment of Choi Hung Estate
Educational Institutions	Ping Shek Estate Catholic Primary School C&MA Sun Kei Primary School (Ping Shek) Former S.K.H. St. John's Primary School Choi Wan St. Joseph's Primary School Sing Yin Secondary School St Joseph's Anglo-Chinese School Good Hope School C.C.C. Kei Shun Special School Ning Po No.2 College Maryknoll Secondary School Carmel Leung Sing Tak School The Mission Covenant Church Holm Glad Primary School Sau Ming Primary School Sau Mau Ping Catholic Primary School Saint Antonius Primary School Saint Antonius Girls' College Evangelize China Fellowship Holy Word School Christian Youth Centre Kindergarten (Yau Tong) Buddhist Ho Nam Kam College The Hong Kong Taoist Association Chan Lui Chung Tak Memorial School C.C.C. Kei Faat Primary School (Yau Tong) S.K.H. Yau Tong Kei Hin Primary School
Community Facilities	Ngau Chi Wan Sports Centre Ngau Chi Wan Municipal Services Building Hong Kong Society for the Blind Factory for the Blind Ping Shek Playground Shun Lee Tsuen Playground Lee On Road Sitting-out Area Haven of Hope Integrated Vocational Rehabilitation Services Centre Shun Lee Estate Community Centre Sau Ming Road Park Sau Yee House Children's Playground Sau Mau Ping Estate Sitting-out Area On Sau Road Park Lam Tin South Sports Centre Lei Yue Mun Road Playground Ko Chiu Road Rest Garden Yau Tong Road Playground
Utility Services	Ngau Chi Wan High Level Fresh Water Pumping Station Ngau Chi Wan Substation Sau Mau Ping Fresh Water Pumping Station Sau Mau Ming Salt Water Service Reservoir

	Yau Tong Group Fresh Water & Salt Water Service Reservoirs
Place of Public Worships	Shun Lee Estate Shun Tak Temple Shun Tin Shrine Sing Yan Kung Ma Temple Tai Shing Temple (Po Lam Road) Cheng Huan (City God) Temple (Po Lam Road) Temple of Guan Yin (Po Lam Road) Fat Yuen Tse (Ma Yau Tong Village) Yau Tong Fook Tak Tong
Cultural Heritage Resources	<u>Grade 2 Historic Building:</u> St. Joseph's Home for the Aged  <u>Grade 3 Historic Building:</u> Man Fat Nunnery at Ngau Chi Wan Village

## **5 ENVIRONMENTAL PROTECTION MEASURES TO BE INCORPORATED IN THE DESIGN AND ANY FURTHER ENVIRONMENTAL IMPLICATIONS**

### **5.1 General**

The EIA Study will investigate those environmental impacts (both cumulative impacts and those arising from the Project) and propose the appropriate mitigation measures with the intention that the Project would be environmentally acceptable and cost-effective. The residual impacts, if any, would be confined within the allowable limits. Subject to the findings of the EIA Study, the following mitigation measures would be incorporated in the design and construction of the Project.

### **5.2 Measures to Minimize Environmental Impacts**

#### **5.2.1 Air Quality**

##### *Construction Phase*

Appropriate mitigation measures and site practices as stipulated in the Air Pollution Control (Construction Dust) Regulation will be implemented to minimize the fugitive dust emissions. Possible key mitigation measures would include:

- Watering on the active works sites/areas, exposed areas and paved haul roads to reduce dust emission;
- Dusty materials on-site should be covered or stored with containment;
- Establishment and use of vehicle wheel and body washing facilities at the exit points of works sites;
- Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering should be applied to aggregate fines;
- 
- Where possible, the routing of construction vehicles and positioning of construction plant should be at the maximum possible distance from ASRs; and
- The surface of all surge piles and stockpiles of blasted rocks or aggregates shall be kept sufficiently wet by water spraying wherever practicable.

##### *Operational Phase*

As no direct atmospheric emissions will arise from the operation of the electric transit system and the stations, mitigation measures would not be required during the operation phase. During the depot operation, the potential air quality impacts from the maintenance works and the associated mitigation measures should be further reviewed in the EIA Study stage.

## 5.2.2 Noise

### Construction Phase

Construction noise impacts can be minimised through adoption of good site practice and management, the use of quiet plant and adoption of noise barriers/enclosures. All construction works should be carried out during non-restricted hours (i.e. 0700 to 1900 hours, Monday to Saturday) unless a Construction Noise Permit (CNP) is obtained from EPD. For works sites/areas near schools, the construction activities should be scheduled to avoid school examination period as far as possible. The following noise mitigation measures are recommended to reduce the noise impact during construction.

- Plant which is well maintained should be operated on-site and regularly serviced during the construction works;
- Silencers or mufflers on construction equipment should be utilised and properly maintained during the construction works;
- Location of items of PME should be sited as far from NSRs as possible;
- Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- The plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
- Provision of temporary/movable noise barriers and enclosures where practicable;
- Installation of temporary noise screening structures or barriers for possible drill & blast area;
- Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities;
- Use of quality powered mechanical equipment (QPME) as far as possible; and
- Use of temporary noise barrier/enclosure to further alleviate the construction noise impacts.

The contractor shall also refer to the mitigation measures available in the Guidance Note “Preparation of Construction Noise Impact Assessment Under the EIAO [GN 9/2023]”.

### Operational Phase – Transit System Noise

Potential noise mitigation measures in the form of vertical noise barriers, semi-enclosures and/or full enclosures at specified locations may be required to alleviate the noise impacts on nearby sensitive receivers from the operation of the transit system. The noise impact and the associated mitigation measures for the possible transit system to be adopted for EKGTS should be further reviewed and formulated in the EIA Study stage.

### Operational Phase – Fixed Plant Noise

During the preliminary design stage, the equipment will be designed to meet the relevant criteria under EIAO – Technical Memorandum (TM). The maximum permissible Sound Power Level (SWL) will be determined for each fixed plant item. The maximum permissible SWL should be specified in the procurement contract, and the equipment suppliers should guarantee the SWL. The fixed plant items should have due regard to the characteristics of tonality, impulsiveness and intermittency as specified in TM on Noise from Places Other Than Domestic Premises, Public Places or



Construction Sites (IND-TM). On-site measurement should be carried out during the testing and commissioning stage to confirm compliance.

### 5.2.3 Water Quality

#### Construction Phase

The following measures are recommended as good site practices to mitigate water quality impact during the construction phase:

- Construction site effluents, including surface runoff, should be appropriately collected, handled, treated and disposed of in accordance with the guidelines in Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PN 2/23) and provisions of Water Pollution Control Ordinance (WPCO);
- Good housekeeping and stormwater best management practices should be implemented to ensure that all construction runoff is well controlled;
- All site construction runoff should be controlled with regularly maintained site drainage system, and silt removal facilities incorporated to prevent high levels of suspended solids from entering surrounding waters or drainage network;
- Appropriate monitoring and mitigation measures should be developed for groundwater control (e.g. probing ahead and pre-grouting during tunnel construction, and installation of waterproof lining after the formation of the tunnel) to minimise the potential groundwater drawdown/ infiltration due to tunnel construction;
- Temporary sanitary facilities should be provided for on-site workers during construction;
- Proper measures should be implemented to prevent oil or fuel spillage, e.g. removal of construction plant with identified oil/fuel leakage from site;
- The contractor shall apply for a discharge license under the WPCO, and any discharge should comply with the terms and conditions of the license;
- Exposed soil areas should be minimised to reduce the potential for increased siltation, contamination of runoff and erosion;
- Construction works should be programmed to minimise surface excavation works during the rainy season (April to September) if possible;
- Earthworks final surfaces should be well compacted, and the subsequent surface protection works (e.g. hydro-seeding) should be carried out immediately after the final surface is formed to prevent erosion caused by rainstorms; and
- Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable.

#### Operational Phase

All effluents and wastewater arising from the operation of the Project should be directed to the public sewerage system via proper connections for treatment and disposal. The practices outlined in ProPECC PN 1/23 for handling, treatment and disposal of operational stage effluent should also be adopted where applicable.

Mitigation measures, including Best Management Practices to reduce storm water pollution arising from the Project, include:

- Drainage system designed to avoid flooding;
- Screening facilities such as standard gully grating and trash grille, with a spacing which is capable of screening large substances such as fallen leaves and rubbish, should be provided at the inlet of the drainage system;
- Road gullies with standard design and silt traps and oil interceptors should be incorporated during the detailed design to remove particles present in stormwater runoff, where appropriate;
- Good management measures such as regular cleaning and sweeping of running surfaces are suggested;
- Manholes, as well as stormwater gullies and ditches provided should be regularly inspected and cleaned; and
- Additional inspection and cleansing should be carried out at manholes, ditches stormwater gullies before forecast heavy rainfall.

#### **5.2.4 Ecology**

##### Construction Phase

Subject to the ecological survey and impact assessment, the following mitigation measures during construction phase will be considered as appropriate to minimize and compensate for the ecological impacts:

- Avoid / minimize habitat fragmentation and unnecessary damage / disturbance to the natural habitats;
- Adopt alternative design or construction methods;
- Carefully plan the placement of equipment and stockpile area in the designated area within the existing disturbed land;
- Translocation / transplantation of unavoidably affected species of conservation importance;
- Compensation for unavoidable loss of important natural habitats (e.g. woodland and natural stream); and
- Good site practices and mitigation measures aiming to reduce impacts from air, noise and water pollution, as well as to minimize the potential groundwater drawdown / infiltration due to tunnel construction as stated in Sections 5.2.1, 5.2.2 and 5.2.3 would also minimize potential indirect impact to the ecological resources.

##### Operational Phase

During operation phase, appropriate measures, including but not limited to noise control and water quality control as stated in Sections 5.2.2 and 5.2.3, and control of direction / intensity of light not spilling into the sensitive areas, should be incorporated into the design of the EKGTS to avoid / minimize the ecological impacts.

## 5.2.5 Landscape and Visual

### Construction Phase

Possible key landscape mitigation measures include but not limited to the followings:

- Tree preservation, transplanting and compensatory planting in accordance with Development Bureau Technical Circular (Works) (DEVB TC(W)) No. 4/2020 – Tree Preservation (or Lands Administrative Office Practice Note 2/2020) and DEVB TC(W) No. 5/2020 – Registration and Preservation of Old and Valuable Trees;
- Control of night-time lighting glare;
- Erection of decorative screen hoarding compatible with the surrounding setting; and
- Hard and soft landscape areas disturbed temporarily during construction shall be reinstated on like-to-like basis, or to the satisfaction of the relevant Government Departments.

### Operational Phase

Subject to the landscape and visual impact assessments, the following mitigation measures will be considered as appropriate:

- Alignment - Review of viaduct alignment, station and depot location at detailed engineering design stage should aim to minimise impacts on landscape resources;
- Design of Built Structures - Aesthetic design of viaduct structures, stations and associated footbridges, depot and tunnel portals to minimise landscape and visual impacts and provide aesthetic enhancement of the existing streetscape should be adopted;
- Vertical and rooftop greening and planting should be introduced into station structures, facades, noise barriers, columns and portal structures, as well as the depot to both minimise visual impacts and act as a positive enhancement of the existing visual environment;
- Tree transplanting and/or compensatory planting for the loss of existing vegetation (including trees, shrubs, mangroves, etc.) due to the Project should be proposed as appropriate to mitigate the impact to the existing trees;
- Restoration of Works Areas around Tunnel Portals - Slopes and areas around tunnel portals should be sensitively restored using greening technologies and planted with predominantly native tree species.

## 5.2.6 Cultural Heritage

### Construction Phase

Potential indirect impacts arising from construction activities are anticipated on the graded built heritage (i.e. St. Joseph's Home for the Aged (Grade 2)) which is located at about 60m from CHE, and on the places of worship in the vicinity of the alignment. Good site practice should be adopted to minimise the indirect impacts. Condition and structural survey might be required for St. Joseph's Home for the Aged (Grade 2) to monitor the impact on this built heritage during construction phase, subject to the findings of assessment to be conducted in the EIA Study stage.

There is no identified SAI within 100m from the EKGTS alignment. Nevertheless, the archaeological potential of the Project area will be reviewed and established, if any, in the EIA stage.

A Cultural Heritage Impact Assessment, including the Built Heritage Impact Assessment and Archaeological Impact Assessment, would be carried out under the EIA Study to assess the potential direct and indirect impacts on cultural heritage resources. Possible mitigation measures for the impacts, where necessary, will be proposed and implemented with prior agreement with the Antiquities and Monuments Office (AMO).

#### Operational Phase

No potential operational impacts are anticipated, subject to further review and findings under the EIA Study.

### **5.2.7 Waste Management**

#### Construction Phase

Standard waste management measures and good site practices that should be implemented to manage C&D materials generated from the Project include preparation of a Waste Management Plan, on-site sorting and reuse of C&D materials, implementation of a trip-ticket system and appropriate handling, storage and disposal of chemical waste in accordance with the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. General refuse should be stored in bins or other types of containers with cover separately from C&D materials and chemical wastes. To minimise environmental impacts, the contractor should employ licensed waste collectors/haulers to regularly remove general refuse from the site, separate from C&D materials and chemical wastes.

#### Operational Phase

General refuse should be collected and removed in appropriate covered containers to prevent odour and windblown litter. Separation of recyclable materials, such as paper and metals, from other waste streams should be encouraged to minimise waste disposal to landfills. All chemical wastes from equipment maintenance should be handled, stored and disposed of properly and in accordance with the requirements of the Waste Disposal (Chemical Waste) Regulation.

### **5.2.8 Land Contamination**

No land use associated with potential contamination is observed along the preliminary alignment of EKGTS. Hence, land contamination is not anticipated at the area mentioned in Section 1.4. Site reappraisal with mitigation measures would be recommended in the EIA Study stage if there are any potential land contamination activities associated with land use changes arising from the design in the next stage of the Project.

## 5.2.9 Hazard to Life

### Construction Phase

Various sensitive receivers along the preliminary alignment are likely to control the use of explosives by limiting the charge weights per delay. Air blast and noise are only potentially a problem at the portals, and these areas would require the inclusion of blast doors at the tunnel portals to minimise the air blast and the noise from the excavation.

The sensitive receivers are usually identified as man-made slopes, retaining walls, natural terrain boulders and potentially unstable terrain. In addition, the vibration analysis should also consider structures such as buildings, flyovers, and viaducts. Utility company facilities such as WSD, DSD, CLP, Town Gas, PCCW, Hutchinson, Cable TV etc., have various vibration and movement tolerances that they impose on their equipment which need to be defined and verified during the preparation of the blasting assessment report in the next design stage of the Project.

The amount and time for blasting would be controlled to lie within the agreed working hours and times by Mines Division (MD) of Civil Engineering and Development Department. As it is assumed that there is no site magazine for storing explosives at this initial stage, daily explosive delivery by MD would be anticipated. However, it is subject to confirmation by MD on the delivery arrangement and the Blasting Assessment Report to be confirmed in the next stage of the Project. Necessary safety precautions and control measures will be proposed during the EIA Study.

Quantitative risk assessment (QRA) should be undertaken if risk to life is found to be a key issue after conducting a review of the risks from the use, transport and storage of explosives during construction. The risk review should confirm the compliance with the risk guidelines in Annex 4 of EIAO-TM. Mitigation measures, if required, would be developed as part of the QRA to be undertaken during the EIA Study stage to ensure compliance with the Hong Kong Government Risk Guidelines (HKRG).

### Operational Phase

No significant impacts are anticipated to be generated by transit system operation. However, any potential hazardous impacts will be reviewed in the EIA Study stage.

## 5.2.10 Landfill Gas Hazard

### Construction Phase

The excavation, drilling and piling works will be conducted in an open-air environment and should be conducted by well-trained construction workers with proper and safe construction methodology to be followed. In accordance with Section 3.18 of the Landfill Gas Hazard Assessment Guidance Note, deep excavations are categorized as Medium sensitivity targets. The required mitigation measures include the use of “semi-active” or enhanced passive gas controls, as well as detection systems.

### Operational Phase

Section 1.1(f) in Annex 7 and Section 3.3 in Annex 9 of the EIAO-TM, Landfill Gas

Hazard Assessment Guidance Note (1997) (EPD/TR8/97), and Landfill Gas Hazard Assessment for Development Adjacent to Landfills (ProPECC PN 3/96) recommend that in general, a qualitative assessment of the risk posed by landfill gas will be required for a development within the 250m Consultation Zone of a landfill site, to ensure appropriate precautionary measures would be designed and implemented to safeguard the development. For particular sensitive developments and/or where the development is particularly close to the landfill site, it may be necessary to undertake a QRA. The requirement for a QRA is usually identified during the qualitative assessment.

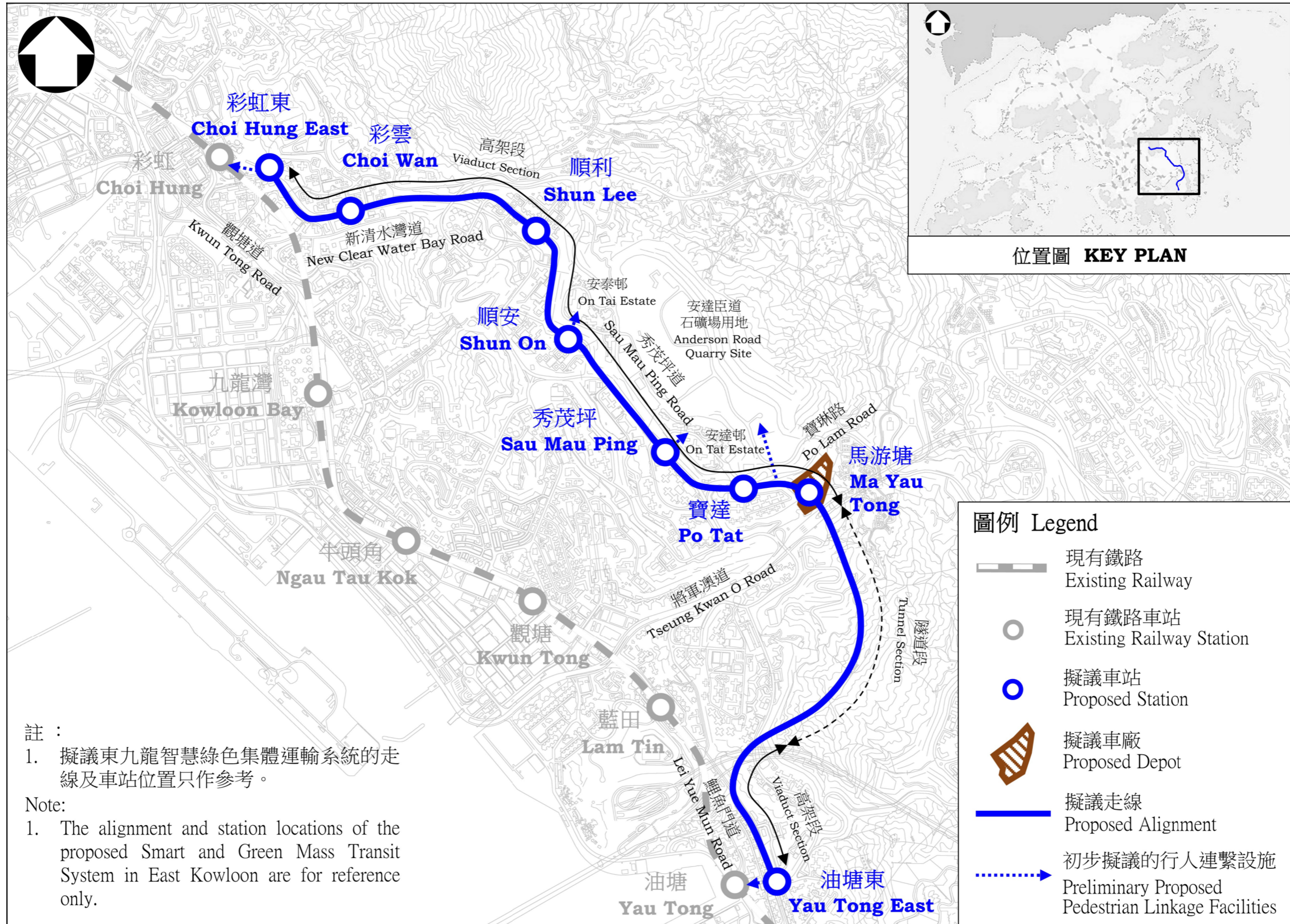
### **5.3 Severity, Distribution and Duration of Environmental Effects and Further Implications**

Subject to the findings of assessments, effective control and mitigation measures would be identified to ensure the impacts are at acceptable levels. The possible severity, distribution and duration of environmental effects and further implications would be considered and addressed in the EIA Study, where applicable.

## 6 USE OF PREVIOUSLY APPROVED EIA REPORTS

There is no previously approved EIA report under EIAO for the Project. Nonetheless, reference may be made to the following previously approved EIA reports and will be referred to in the subsequent EIA Study:

<b>Register No.</b>	<b>Title</b>
EIA-235/2015	Development of Anderson Road Quarry site - Road Improvement Works
EIA-234/2015	Development of Anderson Road Quarry site - Rock Cavern Developments
EIA-222/2014	Development of Anderson Road Quarry
EIA-210/2013	Tseung Kwan O - Lam Tin Tunnel and Associated Works
EIA-005/1998	Planning and Engineering Feasibility Study for Development at Anderson Road



圖則名稱 drawing title

工務計劃項目第66TR號 - 東九龍智慧綠色集體運輸系統 - 初步方案

PWP ITEM No. 66TR - Smart and Green Mass Transit System in East Kowloon - Preliminary Scheme

圖號 drawing no.

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